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Alaska State Legislature

Representative Carl E. Moses



CHAIRMAN
HOUSE RULES COMMITTEE

CHAIRMAN
HOUSE SPECIAL FISHERIES COMMITTEE

MEMBER
FINANCE SUBCOMMITTEES
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FOR IMMEDIATE RELEASE

MARCH 3, 1993

HOUSE FISHERIES COMMITTEE TO TAKE UP HATCHERY REVIEW

JUNEAU--Representative Carl Moses, Chair of the House Special Committee on Resources, announced today that his committee will take up the Legislative Review of the Alaska Salmon Enhancement Program that was begun in 1991 under the leadership of Senator Dick Eliason.

That review included a report prepared by Senator Eliason's Special Committee on International and Domestic Commercial Fisheries which was the first comprehensive examination of the entire salmon enhancement program since its inception 20 years ago. The draft report went out for public review in 1992. The Legislature followed up on one of the report's recommendations by incorporating a wild fish stock policy into statute in May, 1992. A final version of the legislative review, incorporating public comments was issued in January of 1993.

The senate's review also included contracting a benefit-cost analysis of the enhancement program from the University of Alaska Fairbanks. That report has also just been released, but has not yet undergone peer review or public comment.

"My intention is to make sure the economic studies in particular get the thorough review they deserve," Representative Moses said. "The Department of Fish and Game is contracting for an independent technical review of the study, and I invite other interested groups to do the same. We need to have all the relevant information before us before making any policy decisions on the enhancement program."

Moses pointed out that since the benefit-cost analysis was developed using innovative computer modelling, it was especially important that the methodology and data used be reviewed by other economists.

"In fact, the researchers themselves admit that there were limitations to the modeling capabilities and the scope of the study, and that certain assumptions had to be made in order to make the project manageable," Moses said. "It may not be possible to judge if the results of this study are statistically significant."

"Additionally, due to funding constraints, the analysis only measured direct benefits of the program to the commercial fishermen themselves. To fully analyze the program, you really need

to examine the indirect impacts and benefits to communities and the other user groups, such as sport and subsistence fishermen."

"The state's salmon enhancement program has worked well for us in the past," Moses said. "We are now producing record numbers of salmon. It should come as no surprise that we need to put more effort into marketing our fish."

Moses said he planned to begin hearings in April on the entire salmon enhancement program. Due to its preliminary nature however, Moses said he would not take public testimony on the economic benefit-cost analysis until the full technical review is completed.

The committee's contact for the review will be Molly McCammon, staff to the House Special Committee on Fisheries. McCammon is staff to the Senate Fisheries Committee for its review and one of the authors of the Senate study. She can be reached at 465-6848.

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STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF FISHERIES REHABILITATION,
ENHANCEMENT & DEVELOPMENT (FRED)

WALTER J. HICKEL, GOVERNOR

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February 4, 1993

Senate Special Committee on
Domestic and International Fisheries
Alaska State Legislature
State Capitol
Juneau, AK 99801-1182

Dear Senators:

Thank you for the opportunity to comment on the 1 February 1993 version of Chapter IX, Economics Section. I have provided specific review comments as you requested. I would like to express my appreciation to Ms. Molly McCammon and Ms. Mary McDowell for including the Alaska Department of Fish and Game (ADF&G) in the review of Chapter IX. They have patiently interacted with us in numerous meetings and phone calls while finalizing the *Legislative Review of the Alaska Salmon Enhancement Program* into a clear preamble to the University of Alaska-Fairbanks (UAF) study on *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program*. I and my staff have summarized our previous comments on the UAF cost-benefit analysis (CBA) and have included recommendations that I have been asked to provide to the commissioner of ADF&G regarding the studies. In the process of our review, we have revisited the entire model and broader policy concerns related to the review and release of the study. ADF&G reviewers have expressed a growing concern over the release of the studies prior to a proper review of the work products and the completion of critical work products.

Comments on Preface and Text for Chapter IX

The preface and text of Chapter IX have become far more readable since our initial review. We have additional comments on the following areas in the text:

1. Under *Other Significant Findings* in Chapter IX:

- Findings regarding each of the individual models need to be reordered according to which statements pertain to the demand model, the cost model, the population model, and the overall CBA.
- It should be indicated for each of the finding statements for isolated models that we do not at this time know how the findings for the individual models affect the net benefits of the program.

Disclaimer in preface and in Chapter IX:

Please expand the disclaimer in the preface to include ADF&G and the Commercial Fisheries Entry Commission. The revised disclaimer should read: "It should also be clearly understood that the economic benefit-cost analysis is solely the product of the university researchers who were authors of the contracted studies. The committee, ADF&G, and CFEC have not taken a position on any of the study findings." We would also suggest that this disclaimer also appear at the bottom of paragraph 1 on page 2 of Chapter IX.

3. Footnote missing on page 5 in Chapter IX:

Suggested text for the missing footnote is as follows: "The 'planned' production level was by far the largest catch level tested and represented the level of production that operators said they would like to be permitted and funded at."

4. Under *Options for Possible Consideration* in Chapter IX:

At this time, it would probably be best to not include this section in Chapter IX. We would not encourage that many of the program management and financing options be presented until they are thoroughly studied. This section may appear as an agenda that is not adequately related to the technical findings of the studies.

Summary of Comments on the UAF report, *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program*

1. The decision to deviate from the original RSA requirement for a 10-, 15- and 20-year mean for background wild catches in the nonintensively modeled fisheries has left numerous unanswered questions on how the models would behave under the likely range of future salmon population sizes.
2. The lack of confidence limits in the models, as noted by the authors, makes it difficult to determine if net benefits cited for the scenarios run are significantly different from zero.
3. The lack of thorough and properly bracketed sensitivity testing of important economic and biological variables is a critical step that must precede drawing any conclusions from the CBA.
4. Many of the technical reports that are clearly required as work products in the RSA are not completed at this time, even though the overall CBA report (December 1992) is referred to as a "Final." ADF&G remains very uneasy that we have not been able to carry out a thorough review of these work products.
5. Regrettably, the final CBA report is still poorly written and in need of further editing. We do not believe that even well-seasoned scientists, who are familiar with the statewide

enhancement program, will be able to gain a sufficient understanding of what was carried out in the combined portion of the model without further clear descriptions and appendices.

6. Because the CBA report is so poorly documented, we did not discover, until well into the review process, that there is a major flaw in the Product Surplus Estimate. This problem, identified in our previous comments, has not been corrected. Fishing costs are double-counted and accounted for incorrectly for the cost recovery fish. We believe that private nonprofit (PNP) operators will rightly be concerned that the authors have allowed this significant flaw to stand.
7. The final CBA report lacks output tables or files that summarize the results annually. This makes it extremely difficult to error check the models. These should have been included as appendices in the final report.

For example, John Boyce, the primary author of the UAF CBA report, supplied a set of annual revenue tables for the CBA simulations that were helpful in understanding how the production numbers relate to the time series of projected benefits and costs. We understood that these tables would appear in an appendix to the final CBA report. Since the 17 policy cases have been reestimated, it would be helpful to include this appendix with the new values.

8. There is no reporting of the algorithms used in the overall CBA, which makes it difficult for the reader to determine if the net benefits are computed correctly.
9. The hatchery production input data is not printed in any of the tables with enough detail so that we can determine whether ADF&G and PNP data are correctly aggregated in the CBA models. These annual tables of harvests of enhanced fish and associated costs of production should appear as an appendix to the CBA report.
10. ADF&G was given a relatively short review window for many of the draft technical work products produced for the UAF CBA report and, in particular, we have not had time to sufficiently review the draft population/exploitation model.
11. One additional concern expressed in our most recent review was the real potential for doing serious and irreversible damage to confidence levels of lending institutions, fishermen, and to our very efforts to manage, restore, and maintain state control over Alaska's salmon fisheries. If, upon further study and review, the point forecasts turn out to be unwarranted, the industry may regret that a more patient approach to finalizing, reviewing, and testing these work products did not occur.

Recommendations

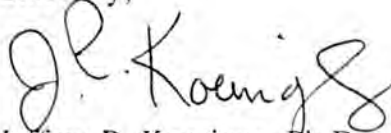
It is with these ongoing concerns still in mind that I make the following recommendations to the commissioner of ADF&G:

February 4, 1993

1. That the CBA report written by UAF and Chapter IX should not be released until all final work products are completed and technically reviewed, even if it requires additional resources. Completion means that the supporting technical reports, relevant software, input and output files, and tables are sufficiently clear so that independent reviewers, ADF&G, and CFEC can completely understand the studies.
2. A well-known fishery economist, with a strong technical background in the new techniques used by UAF, should be selected for an independent review of the studies. It is suggested that this review emphasize the readiness of the models and current analysis to be relied upon for making serious and irreversible policy changes to Alaska's salmon fisheries (see enclosed list of potential candidates).
3. Since the RSA clearly identifies that the study is the property of the Alaska State Legislature, the draft study should be given to legislators with a sincere interest in fishery issues to determine what they want to do with it. We would also suggest a public review of the draft study before releasing it as a final product.

Again, I appreciate the opportunity to comment.

Sincerely,



Jeffery P. Koenings, Ph.D
Director

cc: Carl L. Rosier
Charles P. Meacham
Bob Burkett
Jeff Hartman
Molly McCammon
Mary McDowell

Enclosure

Extended Peer Review for the Technical Studies and Overall Cost-Benefit Analysis

The Alaska Department of Fish and Game (ADF&G) believes that there are compelling reasons for an independent review of the models and work products in the cost-benefit analysis (CBA). The primary reason is that the economists in charge of the review for the models acknowledge that they have not been exposed to some of the very new and highly novel techniques and statistical procedures used in these models. There are only a handful of economists in the country who are well-versed in some of the procedures used. This review should begin only after the work products are finalized to the point that a detailed technical reviewer will have what he/she needs to begin.

Some economists who are qualified to carry out an independent review include:

James Wilen, University of California-Davis
Biing-Hwan Lin, University of Idaho
Ron Mittelhammer, Washington State University
Jim Anderson, University of Rhode Island
Ira Strand, University of Maryland
Gardner Brown, University of Washington
Terrence Smith, ISER, University of Alaska-Anchorage

The primary question that we should ask in this review is whether the models and existing simulations are sufficient to evaluate the economic consequences of major directional changes in Alaska's salmon management and enhancement policies.

there will be no way to stop them from entering in the long run. However, by maintaining some hatchery production, prices may remain depressed enough to prevent expansion in those areas. As long as the price is not driven down to the level that it would reach if those areas do enter the market, the hatchery dollars spent on prevention of entry may be well spent. However, this is not a strategy which can remain viable over the long run.

Another area that appears to be fruitful for future exploration is the allocation among gear groups. In the cost study we observed that the different gear groups have vastly different levels of producer's surplus. The gear group that does the best is the set net fleets. This is mainly because these fleets have such low capital costs. The bottom line is it is more efficient to let the fish come to the fisherman than to have the fisherman go to the fish.

Finally, let us emphasize that our estimates of net benefit are based on parameters estimated from relatively short time periods and were extrapolated well beyond the time horizon for which accurate estimates may be obtained. There are also a number of exogenous factors, such as what is happening in the rest of the salmon suppliers' markets, that have changed far too rapidly over the last decade to allow precise estimates of where the industry will be in one, two or three decades. In spite of this, given our predictions of trends in the rest of the markets, the economic indications are that the enhancement program, and especially the pink salmon program, should be scaled back. Our estimates suggest that to do so could result in an increase of net benefits to the state on the order of almost a four-hundred million dollars over thirty years relative to current and planned production levels.

To Molly
Fr McWhorter

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474-5018

VFA Thurs
5:30-7:30
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STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF FISHERIES REHABILITATION,
ENHANCEMENT & DEVELOPMENT (FRED)

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FEB 16 1993

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February 10, 1993

Ms. Molly McCammon
c/o Representative Carl Moses
Alaska State Legislature
State Capitol, Room 204
Juneau, AK 99801-1182

Dear Molly:

Following our February 8 conversation, I understand that I have permission from the Legislature to send some of the preliminary and final work products from the University of Alaska-Fairbanks' cost-benefit analysis to Dr. James Wilen at the University of California-Davis. I will ask Dr. Wilen not to distribute any copies he receives. He will be asked the following questions:

1. Are the work products analytically sound enough to be worth the effort of carrying out a technical review?
2. How long will it take to complete a quality review of the technical aspects of the cost-benefit analysis model and report, demand model, cost model, and simulations that would stand some scrutiny?
3. How much will it cost for you to carry out a good, quality review?
4. What are your initial impressions of the studies?

I will be sending Dr. Wilen the following manuscripts and preliminary work products and provide you with a copy of the cover letter to Dr. Wilen.

1. *Legislative Review of the Alaska Salmon Enhancement Program*, January 1993, Draft Chapter IX - Economics. Alaska State Senate Special Committee on Domestic and International Commercial Fisheries.
2. *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program*, December 1992, final report by Boyce, Herrmann, Bischak, and Greenberg.

3. Cost-Benefit Analysis (CBA) annual and aggregated net benefit output tables, November 1992, draft by John Boyce.
4. *An International Marketing Model for Alaskan Salmon*, November 1, 1992, draft by Herrmann and Greenberg.
5. Executive Summary, *An International Marketing Model for Alaskan Salmon*, December 15, 1992, draft by Herrmann and Greenberg.
6. Demand Model Simulation Model Code in SAS, December 1992, draft by Mark Herrmann.
7. Demand model output prices by species, year, policy case, region, and aggregated regions, December 1992, Mark Herrmann.
8. Using Participation Data to Estimate Fishing Costs for Commercial Salmon Fisheries in Alaska, November 1992, draft by John Boyce.
9. ADF&G technical comments to Senate Special Committee on Domestic and International Fisheries from Jeffery P. Koenings, February 4, 1993.
10. Reimbursable Services Agreement Contract Specifications and Request for Proposals for Software Development and Policy Analysis of a Benefit-Cost Analysis of the Statewide Enhancement Program.

Thank you for your interest in this matter.

Sincerely,



Jeff Hartman
Economist

cc: Geron Bruce
Bob Burkett
Johnny Holland
Jeff Koenings

Justification for Technical Review of UAF CBA Model

by Jeff Hartman, 2-10-93

It is customary in technically challenging econometric studies, or where there are significant policy implications from studies, that contracting agencies seek independent technical reviews. It is also a prudent action when the reviewers of the contracts express some uncertainty about their own ability to interpret the findings. The UAF CBA meets and exceeds all three of these criteria.

The demand model by Herrmann and Greenberg has over 50 equations and requires about 16 hours to estimate on a 486 33Mh. Some of the econometric techniques used in the "block 1" estimates are new, and few economists have extensive experience with them.

Two of the four economists reviewing the contracts, Kurt Schelle and Ben Muse, possess a Ph.D. in economics and have extensive experience in fisheries economics. They have expressed reservations about their abilities to interpret certain new techniques used in the demand model. Though I have spent several hours trying to unravel the block 1 and 2 estimates, I also cannot confidently say that the methods are or are not technically sound approaches to generating long-run projections of price response. I have never reviewed an econometric model that is this nested or uses such novel statistics.

Other technical questions, both theoretical and methodological, have been raised about the fishing cost and population models used in the studies. Finally, the net benefit algorithms, the summarizations of input data, and statistical significance of the net benefit point projections have been questioned.

All of these issues, by themselves, lead to the need for some independent, technical review. However, the timing of the review with respect to whether it occurs before or after the studies are released appear to be a critical concern because of possible policy implication and the high potential of misinterpreting the model implications.

A study that had severely negative implications about the future for Alaska's salmon industry could, at this time, have a strong impact on private and public sector decisions. The study could have an effect on Government policy for the enhancement program, fishery management, loans to fishermen, bycatch of salmon, marketing of seafood, and the U.S./Canada Pacific Salmon Treaty. Perceptions of private lenders and fishermen may also be impacted, along with limited entry permit markets.

With these issues in mind, I am supportive of the proposal to develop an independent, technical review of the full cost-benefit analysis. I would suggest that this review begin only after the work products are finalized to the point that a detailed technical review can actually occur. The primary question that we should be asking in this review is if the models and existing simulations are sufficient for making major directional changes in Alaska salmon management and enhancement policies.

Additional discussions on the proposed technical review.

1. On 2-3-92, I contacted CFEC (Kurt Schelle) and asked if CFEC would be willing to act as the contracting agent for a technical review of the CBA studies. He said that he would consider it, but would have to discuss it with others at the Commission. I felt that since they have technical ownership of all of the materials and work products of the study (they were the contracting agency for the original modeling), that CFEC would be the best group to contract through for an impartial review. I believe that CFEC should be given the full authority to choose the contractor and the questions to be asked. I trust them to make sure that the questions to the contractor should be framed in an objective manner.
2. I talked with our contract people to see how difficult it would be to A/E \$2,500 over to CFEC to carry out a review. They said that it would be fairly straightforward.
3. I contacted James Wilen, my first choice as a technical reviewer. Wilen is extremely knowledgeable about salmon demand models and fishing cost models. He is familiar with the work of Mark Herrmann, Ron Mittelhammer, and John Boyce which gives him a considerable head start in being able to carry out an efficient review. He has worked for the AG's office on the oil spill economic damage assessment, specializing in commercial fisheries. He is a long-time friend of Don Collinsworth and knows much about how Alaska fish politics work. He has a current background in econometrics and is familiar with the Bayesian bootstrapping and other new econometric techniques used in the demand models.

Wilen believes that it is a good idea to get the studies reviewed if they could have important policy implications. He said that it would probably take a week of intense work, but if he could see some of the draft reports, he would be able to give us a more precise time estimate. I have received permission to send him some of the draft copies.

If it is alright to ship them to him, I would ask him:

1. Would it be worth investing the time to review the studies?
2. How long would it take?
3. How much would it cost?
4. What are your initial impressions?

My impressions about other possible researchers for a Technical Review include:

Ron Mittelhammer is probably not impartial since he put Herrmann onto these techniques in the first place. Also, he is a co-author and major professor of Herrmann on the publications that initially resulted in the block I estimates. I understand he is a very good econometrician, but don't know him personally.

Biing-Hwan Lin is not really available. He now works for the federal government on other issues, and also has been a co-author on related studies with Herrmann.

I have not yet contacted Jim Anderson. He may be interested and probably has sufficient skills. I do not know him very well. Also, I do not know if he could be trusted to write a good summary. I was not that impressed with a piece he did for Commerce a few years ago.

ISER is probably out because they competed for the original contract. I do not feel that they would be very objective, since there seems to be some competition between the campuses.

Terrence Smith is now at Woods Hole. He would probably have a good overall understanding of the technical aspects of the CBA, but I doubt would have specific knowledge about the new techniques used in the demand model.

Ira Strand worked on commercial fisheries damage assessment for the feds after the *Exxon Valdez* oil spill. I understand that he is a strong theorist. I do not know about his other skills and have not contacted him.

Gardner Brown is not known for his econometrics, which may be a real problem in the review. He is very opinionated, understands Alaska fish politics, and is known to be very practical. He is also a clear writer, all of which would probably be an advantage.

Lou Querillo is probably not quite strong enough in the newest wave of econometrics techniques to be a prime contender. I do not believe that he would have many new comments that Ben, Kurt, or I would not have identified. I also doubt that he would have the time. I also do not know what is involved for transferring review funds to NMFS.

Jim Wilen is as close to perfect for the job as I can imagine. He has a strong reputation as an impartial reviewer and seems to have a significant amount of prior knowledge of Boyce and Herrmann's work. He says that he is interested in doing the job, would be impartial and fair, but not pull any punches. He clearly has the econometric skills to do the work. I know him to be an excellent communicator and writer.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF FISHERIES REHABILITATION,
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February 11, 1993

James Wilen, Ph.D.
Professor
Department of Agricultural Economics
University of California-Davis
116 Voorhies Hall
Davis, CA 95616

Re: Technical Review of Cost-Benefit Analysis

Dear Dr. Wilen:

The Alaska Department of Fish and Game (ADF&G) has received permission from the Alaska State Legislature to send you work products from a recent cost-benefit analysis of the statewide enhancement program. We are interested in a comprehensive review of the economic techniques and validity of the case studies used in this endeavor for application to potentially large policy changes in the management of the Alaska salmon industry.

These studies have been the source of some controversy during the technical review process. The issues involve (1) the level of completeness of the work products in the Reimbursable Services Agreement, (2) the uncertainty surrounding the validity of the estimations and point estimates generated in the simulations, and (3) the potential for irreversible policy actions that might be taken by state government and private parties if point estimates turn out to be wrong. The first two issues are exacerbated by a lack of exposure of the technical review team which consisted of Ms. Ginny Fay, Mr. Jeff Hartman, Mr. Ben Muse, Dr. Kurt Schelle, and me to some of the new statistical procedures used when estimating the demand model.

For these reasons, the legislature has requested that the Commercial Fisheries Entry Commission (CFEC) select an independent contractor to carry out a technical review of the studies. Jeff Hartman believes that you are the best candidate for the technical review. Since the professional services contract would be through CFEC, they would, of course, have final authority over who was chosen and how the questions would be framed.

To help us decide how to proceed, it would be helpful if you could answer the following questions about the technical review. Because many of these studies are in draft form, I would, however, like to request that they not be distributed. The questions I pose to you follow:

1. Are the work products analytically sound enough to be worth the effort of carrying out a technical review?
2. How long will it take to complete a quality review of the technical aspects of the cost-benefit analysis model and report, demand model, cost model, and simulations that would stand some scrutiny?
3. How much will it cost for you to carry out a good, quality review?
4. What are your initial impressions of the studies?

I have enclosed the following manuscripts and preliminary work products for your review.

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10. Reimbursable Services Agreement Contract Specifications and Request for Proposals for Software Development and Policy Analysis of a Benefit-Cost Analysis of the Statewide Enhancement Program.

If you are selected to carry out the technical review, I would obtain the final versions of the work products from the researchers prior to initiating the review. This would probably not be

February 11, 1993

before March. Also, there are a number of comments and some reply memos that have previously been developed on the manuscripts which we would sort through and provide you with.

If you have any further questions about the study, please contact Jeff Hartman at 465-6155. Thank you for your assistance.

Sincerely,

*Jeff Hartman for
Jeffery P. Koenings*

Jeffery P. Koenings, Ph.D.
Director

Enclosures

cc: Geron Bruce
Bob Burkett
Johnny Holland
Molly McCammon

DRAFT

FOR IMMEDIATE RELEASE

Contact Douglas Schneider, science writer, (907) 474-7449, Mark Herrmann, resource economist, (907) 474-7116, or John Boyce, resource economist, (907) 474-5199.

UAF study says hatcheries a bad state investment

FAIRBANKS, Alaska—A worldwide glut of salmon and low fish prices have made investing in hatcheries, especially pink salmon hatcheries, a money-loser for the state, according to economists at the University of Alaska Fairbanks.

In a cost-benefit study of the state's Salmon Enhancement Program, UAF economists compared state funding of hatcheries with revenues of fishermen who harvest hatchery-reared salmon. The study found that, given present market trends and salmon production levels, Alaska will spend far more on salmon hatcheries than fishermen will make in profits during the next 30 years.

"It basically says that hatcheries may no longer be a wise investment of state money," said Mark Herrmann, a resource economist at the UAF School of Management Fisheries Economics Center, and an author of the study. "The state is pumping millions more into the enhancement program than fishermen make in net profits from those fish."

According to the UAF study, hatcheries might generate just \$147 million in net revenues to fishermen over the next 30 years, while state spending on enhancement programs is expected to cost from \$300 to \$500 million.

Pink salmon hatcheries may be the state's biggest money-loser, the study found. If pink salmon production were to stop immediately, fishermen actually would make more money, as much as \$147 million more during the next 30 years. And if the entire state-run and private non-profit hatchery programs were eliminated, fishermen might earn \$292 million more over the next 30 years.

"Right now there's just too much salmon, especially pink salmon, on the market," said Herrmann. "The surplus has brought the prices way down. If that extra production were eliminated, prices would go back up and fishermen may earn more."

Not surprisingly, private non-profit aquaculture corporations, funded in part by grants and loans from the state, disagree with the study's findings. While there may be too much salmon around, they say closing hatcheries isn't the answer.

"There's a lot this study didn't consider," said Heather McCarty, a spokesperson for the Prince William Sound Aquaculture Corporation, the state's largest producer of hatchery salmon.

McCarty said the study did not consider a domestic marketing program or the new products being made from salmon. Nor did the study foresee Tyson Foods' entry into the seafood industry. Tyson, a major chicken producer, recently announced plans to aggressively market Alaska salmon in it's U.S. markets.

quote (waiting to talk with Heather again.)

Fisherman-supported aquaculture corporations operate 25 hatcheries in Alaska, and produce one-quarter of the fish harvested in the state's commercial fisheries. Since the salmon enhancement program began in 1972, Alaska has provided \$71 million in loans and \$12 million in outright grants to private non-profit hatcheries. The loans remain largely unpaid in part because of a six year grace-period extended to help hatcheries become self-sufficient. The state also has spent more than \$210 million to operate its 12 hatcheries during the last 20 years.

In recent years, huge worldwide salmon surpluses and fierce competition from foreign salmon farmers have eroded Alaska markets and sent prices paid to fishermen into a tailspin, the study said. Also mentioned were inroads being made into Alaska markets by Russian salmon.

Also not mentioned were hatchery's indirect benefits, such as providing processing employment and money brought into the state through support services. Rick Lauber, the Alaska manager of the Pacific Seafood Processors Association, said closing down hatcheries probably won't have much effect on processing employment because wild stocks have rebounded from record low levels seen in the 1970s.

"There is a role for hatcheries," said Lauber. "When Alaska got into the hatchery business, wild stocks were on the downside, and hatcheries filled the void. Now the natural runs are back, except for places like Prince

William Sound, and we have huge runs of both wild and hatchery salmon. All those salmon have really loaded the system and drove prices down."

The study, begun in 1991 at the request of the state's now-defunct Senate Special Committee on Domestic and International Commercial Fisheries, was turned over to the House Special Committee on Fisheries last month.

Among the findings of the UAF study:

- Current pink salmon production levels may be too high. Production of sockeye salmon also has approached a level where statewide revenue gains from increased production will be small.
- Changes in enhanced production in one region of the state may have significant positive and negative impacts on the revenues of other salmon-producing regions of the state through their effects on market prices.
- Small changes in supplies of wild or farmed salmon have more of a price-depressing effect on Alaska fisheries.
- Seafood buyers and consumers believe farmed salmon is a close substitute for the higher-valued Alaska salmon species.
- Increasing production to levels currently planned by the enhancement facilities appears to result in net losses statewide because of losses in Western Alaska, Kodiak, and Southeast Alaska.



Alaska Sea Grant
College Program

news release

UNIVERSITY OF ALASKA FAIRBANKS

School of Fisheries and
Ocean Sciences

Fairbanks, AK 99775-5040

Phone: (907) 474-7086

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*Darlene Komisar
Pres. Komisar*

*Louis Proenza
dir of research -
474-7311*

FOR IMMEDIATE RELEASE

*Ron Dearborn -
2/19/93*

Alaska Sea Grant News Release 0104

Contact Mark Herrmann, resource economist, (907) 474-7116; John Boyce, resource economist, (907) 474-5199; Joshua Greenburg, resource economist, (907) 474-7189; or Douglas Schneider, science writer, (907) 474-7449.

no recommendations.

UAF study recommends state curb hatchery funding

FAIRBANKS, Alaska—A worldwide excess of salmon and low fish prices have prompted University of Alaska Fairbanks economists to recommend the state scale back funding to pink salmon hatcheries.

consider scaling

In a cost-benefit study done as part of a wide-reaching legislative review of the state's salmon enhancement program, UAF economists compared state funding of state-run and private non-profit salmon hatcheries with revenues of fishermen. The study recommends the state scale back funding to Alaska pink salmon hatcheries, a move that might reduce world salmon supplies and push up prices paid to fishermen during the next 30 years.

being we hired a study.

all funding, not just state

Curbing state hatchery funding also would free-up state money that could be spent elsewhere, or applied to any future state budget shortfall, the study's authors said.

"It basically says that some hatcheries may no longer be a wise investment of state money," said Mark Herrmann, a resource economist at the UAF School of Management Fisheries Economics Center, and an author of the study. "The state is pumping millions more into the enhancement program than fishermen make in net profits from those fish."

- MORE -

*Al Tyler
Assoc dir of School of Fisheries*

*implied
state funding?*

Fisherman-supported aquaculture corporations operate 25 hatcheries in Alaska, and produce nearly one-quarter of the fish harvested in the state's commercial fisheries. Since the salmon enhancement program began in 1972, Alaska has provided \$71 million in loans and \$12 million in grants to private non-profit hatcheries. The loans remain largely unpaid in part because of a six-year grace period extended to help hatcheries become self-sufficient. The state also has spent more than \$210 million to operate its own 12 hatcheries during the last two decades.

But in recent years, Alaska hatcheries have produced record returns of salmon, especially pink salmon. The production has contributed to huge worldwide salmon surpluses, at a time when fierce competition from foreign salmon farmers have eroded Alaska markets and sent prices paid to fishermen into a tailspin. Increased salmon production expected from Russia may have additional negative effects on the value of Alaska salmon exports, Herrmann said.

"Right now there's just too much salmon, especially pink salmon, on the market," said Herrmann. "The surplus has brought the prices way down."

According to Herrmann, eliminating state funding of pink salmon hatcheries would save the state money while helping to shore-up salmon prices. About \$147 million would be saved over the next 30 years, according to the study. The savings would come in the form of reduced hatchery operating costs and increased net revenues to fishermen. The numbers used in the study reflect the present value of future earnings.

"If that extra production were eliminated, we believe prices would start to go back up and fishermen would earn more," said Herrmann. "Of course, if Alaska really wants to increase revenues, it should combine these cuts with an aggressive marketing strategy."

But the study also found important regional differences in how fishermen would be affected by state cuts to enhancement programs. If pink salmon production were eliminated throughout the state, Prince William Sound fishermen, who depend on hatchery salmon for much of their catch, would lose \$114 million in net revenues over the next 30 years. By contrast, eliminating hatchery pink production in Alaska would benefit fishermen in Southeast, where stocks are mostly wild. Southeast fishermen would earn \$122 million in additional net revenues under this scenario.

While the economists stand by their conclusion that overall hatchery funding should be scaled back, they caution that the study is based on complex economic models that may not hold true in ever-changing world salmon markets. Molly McCammon, staff assistant to the House Special Fisheries Committee, agrees.

"The findings are just not that absolute," McCammon said. "The numbers are based on some cutting edge computer models and a lot of assumptions that may not turn out to be the case."

Not surprisingly, private non-profit aquaculture corporations, funded in part by grants and loans from the state, disagree with the study's findings. While there may be too much salmon around, they say reducing state funding to hatcheries isn't the answer.

"There's a lot this study didn't consider," said Heather McCarty, a spokesperson for the Prince William Sound Aquaculture Corporation, the state's largest producer of hatchery salmon.

McCarty said the study did not examine the effect a planned domestic marketing program would have on prices, or the effect new salmon products would have on markets. Nor did the study foresee Tyson Foods' entry into the seafood industry. Tyson, a major chicken producer, recently announced plans to aggressively market Alaska salmon in the United States.

The study also did not consider hatcheries' indirect benefits, such as providing processing employment and support services. Rick Lauber, the Alaska manager of the Pacific Seafood Processors Association, said scaling back hatcheries probably won't have much effect on processing employment because wild stocks have rebounded from record low levels seen in the 1970s.

"There is a role for hatcheries," said Lauber. "When Alaska got into the hatchery business, wild stocks were on the downside, and hatcheries filled the void. Now the natural runs are back, except for places like Prince William Sound, and we have huge runs of both wild and hatchery salmon. All those salmon have really loaded the system and drove prices down."

The study, begun in 1991 at the request of the Alaska Senate Special Committee on Domestic and International Commercial Fisheries, was turned over to the House Special Committee on Fisheries last month. Rep. Carl Moses, AI, Unalaska, chairs the committee.

UAF economists could not reach firm conclusions on the future profitability of hatcheries that raise chum, sockeye, king, and coho salmon.

Among the conclusions of the UAF study:

- If a region wants to continue with a hatchery program, the most cost effective and marketable production level and composition would result if the program were entirely funded by the local user groups rather than subsidized by the state.
- Current pink salmon production levels may be too high. The findings suggest that production of sockeye salmon also has approached a level where statewide revenue gains from increased production will be small.
- Changes in enhanced production in one region of the state may have significant positive and negative impacts on the revenues of other salmon producing regions of the state through their effects on market prices.
- Small changes in supplies of wild or farmed salmon have more of a price-depressing effect on Alaska fisheries than previously reported in other research on salmon demand.
- Farmed salmon is a close market substitute for the higher-valued Alaska salmon species.
- Increasing production to levels currently planned by the enhancement facilities appears to result in net losses statewide because of losses in Western Alaska, Kodiak, and Southeast Alaska.

Fax Sheet

From:

Name:

Phone Extension:

ALASKA SEA GRANT COLLEGE PROGRAM

304 Eielson Building

University of Alaska Fairbanks

Fairbanks, AK 99775-5040

PHONE: 907-474-7086

FAX: 907-474-6285

Name:

Dept/Company:

Fax #:

Number of pages
including this cover sheet:

5



MESSAGE:



2-19-93

1pm

Here's the final story. It goes
to the media at 3pm. Please call me before
then if you have major concerns, otherwise
I'll assume it's okay. Thanks for your help.

Regards,

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF FISHERIES REHABILITATION,
ENHANCEMENT & DEVELOPMENT (FRED)

WALTER J. HICKEL, GOVERNOR

P.O. BOX 3-2000
JUNEAU, ALASKA 99802-2000
PHONE: (907) 465-4160
FAX (907) 465-4168

RAPIFAX TRANSMITTAL SHEET

To: Molly McCammonDate: 2-24From: Jeff HartmanNo. Pages 5
(following this page)

Message:

Molly: Update on technical review from Nihon.
Also, did you send work product request to researchers
If not, and you still intend to, dates should be advanced as
I have with the Commission on the Fish.

UNIVERSITY OF CALIFORNIA, DAVIS

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SANTA BARBARA • SANTA CRUZ

Address reply to:
DEPARTMENT OF AGRICULTURAL ECONOMICS
DAVIS, CALIFORNIA 95616-8512
Administrative Office - (916) 752-1514
FAX - (916) 752-2014

COLLEGE OF AGRICULTURAL AND
ENVIRONMENTAL SCIENCES
AGRICULTURAL EXPERIMENTAL STATION

February 23, 1993

Jeff Hartman
FRED Division
Dept. of Fish and Game
State of Alaska
Juneau, Alaska

Dear Jeff:

I have had a chance to briefly review the materials you sent me relating to the University of Alaska Fairbanks cost benefit analysis of the Salmon Enhancement Program. My quick review suggests several components of the study which appear to contain either questionable assumptions or methods whose confidence needs further examination. It is my opinion that the implications of some of the conclusions are too far reaching to motivate major policy changes without a serious independent review of the whole study. If you would like to discuss this further please feel free to phone me at (916) 752-6093.

James E. Wilen

Dept. of Agricultural Economics
University of California, Davis
Davis, California 95616

Wilen seemed to think that he could carry out a review between April 1 + 31st. Actual review would take about 5 working days. No overhead charges would be made. Review start + end dates depend on when technical Reports are provided in Final form by contractors + other materials.

Letter
ALASKA STATE LEGISLATURE
Representative Carl Moses

to: John R. Boyce, Ph. D. and
Mark Herrmann, Ph. D.

Center for Fisheries Economics
Department of Economics
University of Alaska, Fairbanks
Fairbanks, AK 99775

from: Ms. Molly McCammon
Special Assistant
Representative Carl Moses
Alaska State Legislature
State Capitol, Room 204
Juneau, AK 99801

I will be acting as the contact for the Legislature to receive the final work products covered under the Reimbursable Services Agreement on A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. While the Final Report for the overall benefit-cost study has been distributed, the RSA calls for some additional work products that have not been received in final form by our office. The purpose of this transmittal is to describe the missing work products and due dates as I understand them, discuss and reach agreement with you on a description, and a final due date for each one. Some of the work products which are inappropriate to keep in the Legislative archives may be housed with the Commercial Fishery Entry Commission.

The following list describes the work products and due dates for various input and output data files, computer code, documentation and technical reports that we have not received. The list is as complete as possible, but there may be some additional information requests that I cannot anticipate at this time. The summary tables and technical reports should be mailed and not sent by fax.

Summary of work products requested by the Alaska State Legislature.

1. Overall CBA Model: While the RSA calls for the overall CBA software in SAS, ADF&G has received the copy in GAUSS and will be reviewing it over the next 2 weeks to determine if it is sufficient in lieu of the more familiar software. I understand that you encountered some difficulty in reprogramming the GAUSS code into SAS. By the ~~end of February~~ *2nd week in March* they will inform us if it is useable. In the interim we request that you assist ADF&G with answering any questions about the GAUSS version of the model.

2. Overall CBA Model: I understand that there are comment statements and some operating instructions in the recent CBA simulation model that you sent to Mr. Hartman. If ADF&G can operate the model, and edit the files without a hands on tutorial then the existing software and

documentation will be sufficient. If they cannot unravel the documentation sufficiently we request a (1/2 or 1 day) hands on tutorial for the overall CBA simulation model at Juneau or Fairbanks. ADF&G would consider to paying travel costs for a tutorial and I would not ask that any travel costs be born by the researchers. If for some reason, the GAUSS version turns out to be totally unworkable, I will reserve the right to ask for a SAS version at some reasonable date set ~~after the end of February 1993.~~ *early in March 1993.*

3. Overall CBA Model: Input files and tables for the CBA simulations in the 17 cases.

-Include a hardcopy of annual tables for hatchery production (harvest) in numbers of fish and pounds by species and region used in the simulations. We do not want just the aggregated wild and enhanced catch. The only production input data I have seen so far are a fax of aggregate production numbers in the output tables for the Thirty year Present Values by Region, by Cases sent to Ginny Fay on November 2, 1992.

-Hardcopy of all other annual input variables such as production costs for state and pnp hatcheries for each year not listed in the CBA report.

4. Overall CBA Model: Output files for the CBA simulations in the 17 cases.

-Include a readable hardcopy of the final version of the Thirty year Present Values by Region, by Case sent to Ginny Fay on November 2, 1992. This set of tables summarized gross benefits, gross costs, and net benefits. I believe that the earlier version was supplanted by a later simulation. If this is not the case, I still need a clean version to be mailed.

5. Demand Model: Detailed technical report for the demand model. Mark Herrmann stated in his memo of December 16, 1992 to Ginny Fay that the technical report for the demand model would be completed by Mid February. I will assume that it can be sent by February ~~15~~²⁸, 1993, but the Legislatures primary interest is in receiving a completed and clear technical report, within the next month. Please let me know if the completion date of February ~~15~~²⁸, 1993 is workable.

5. Fishing Cost Model: Detailed final technical report for the model. It is my understanding that the author was going to make further editorial changes in this report and provide us with a final also by mid February. Please let me know if the completion date of February ~~15~~²⁸, 1993 is workable.

6. Demand Model: We would like to have a hardcopy of the file that you used to convert numbers of wild and enhanced fish in non-intensely modeled sites to pounds. We want to see the mean weights used for these and know where they came from.

7. Demand Model: A cleaner copy of the response memo from Mark Herrmann to Ginny Fay of December 6, 1992. The fax that I have is not readable.

8. Demand Model: The Legislature should have access to the GAUSS code and SAS log file for the estimation procedures used in the demand model. I may not ultimately need to ask you for the estimation code if the Final Technical Report provides sufficient information on the estimation

procedures. Any estimation code for models and functional forms that Mark tested, and did not work, would not be requested. At this time, I want to reserve our rights to the final model estimation procedures only if needed. I am happy to discuss this further.

9. Demand Model: Mark Herrmann's memo of December 6, 1992 states that he will be working on a final simulation model over the next 6 months. I assume that it would be completed in May 1993. The memo also says that he plans to provide us with a more user friendly version of the simulation model at that time. Since the existing software that you sent to Jeff Hartman does not have sufficient comment statements or documentation for ADF&G SAS users to easily duplicate, I would like to accept your offer for the more thoroughly documented version that you indicate will be available in May. Would this be available by May 31, 1993?

10. Demand Model: ADF&G will be reviewing the SAS code for the simulation models and trying to get them to run in the first 2 weeks of March. We request that you assist them by answering any questions that are generated during that review. Prior to the review ADF&G would like to obtain a copy of the SAS log print out from one simulation of the model.

11. Demand Model: If you are going to be rewriting the simulation software to be more user friendly anyway, it would help if there were clearer comment statements in the SAS code for the simulation model. The comments are mostly difficult to read handwritten notes.

12. Demand Model: Please give a rough estimate of the amount of time required to run 1 case with the demand model simulation software, and note the speed of the computer that you are using.

13. Please supply the remaining files for data required to run remaining 11 simulations. The Base case was previously sent. It would be helpful to receive this by mid March.

14. Demand Model: In lieu of a detailed users instructions for the SAS simulation model, we request a 1 day hands on tutorial for the Demand model in Fairbanks or Juneau. ADF&G would like to arrange for this following the completion of the more user friendly version in May (the completion date that Mark Herrmann noted in His December 6, 1992 memo).

15. Fishing Cost Model: Please send an electronic file of the GAUSS code used to edit the fish ticket file into daily observations for the final regressions used in the fishing cost study. This does not need to have comment statements. This should be sent by March 31, 1993.

16. Fishing Cost Model: Electronic copies of aggregated and final datasets for the cost model need to be sent to CFEC. ADF&G has expressed interest in paying for reasonable file transfer, storage and shipping costs for this data. Please contact me for an estimate.

Finally, my intent here is to make sure that all of the requirements of the RSA funded by the Alaska State Legislature are completed. Our requests for the final work products should, however be reasonable for the researchers to respond to. I need to be contacted by February 23, 1993 to discuss any questions you may have about the final the work products or associated due dates.

March 1,

cc:

Dianne Bischak
Joshua Greenberg
Keith Criddle
Jeff Koenings
Kurt Schelle

Alaska State Legislature

Representative Carl E. Moses



CHAIRMAN
HOUSE RULES COMMITTEE

CHAIRMAN
HOUSE SPECIAL FISHERIES COMMITTEE

MEMBER
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UNALASKA, ALASKA 99685
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FAX: (907) 581-2875

February 25, 1993

John R. Boyce, Ph.D.
Mark Herrmann, Ph.D.
Center for Fisheries Economics
Department of Economics
University of Alaska Fairbanks
Fairbanks, AK 99775

Dear Drs. Boyce and Herrmann:

I would first of all like to thank you both for your efforts in assisting the Legislature with its review of the state's salmon enhancement program. Those of us directly involved in the project, realize --and appreciate-- how much work it has entailed.

I will be acting as the contact for the Legislature to receive the final work products covered under the Reimbursable Services Agreement on A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. While the Final Report for the overall benefit-cost study has been distributed, the RSA calls for some additional work products that have not been received in final form by the Legislature. Without them, our accounting division will not authorize final payment. The purpose of this transmittal is to describe the missing work products and due dates as I understand them, and discuss and reach agreement with you on a description and final due date for each one. Some of the work products which are inappropriate to keep in the Legislative archives may be housed with the Commercial Fisheries Entry Commission.

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information on the estimation procedures. Any estimation code for models and functional forms that Mark tested, and did not work, would not be requested. At this time, we want to reserve our rights to the final model estimation procedures only if needed. I would be happy to discuss this further.

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Finally, my intent here is to make sure that all of the requirements of the RSA funded by the Alaska State Legislature are completed. Our requests for the final work products should, however, be reasonable for the researchers to respond to. I need to be contacted at 465-6848 by March 1, 1993 to discuss any questions you may have about the final work products or associated due dates.

week of March, they will inform us if it is usable. In the interim, we request that you assist ADF&G with answering any questions about the GAUSS version of the model.

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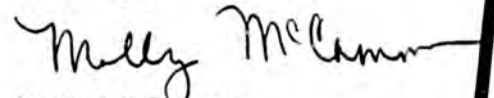
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9. Demand Model: The Legislature should have access to the GAUSS code and SAS log file for the estimation procedures used in the demand model. We may not ultimately need to ask you for the estimation code if the Final Technical Report provides sufficient

The House Special Committee on Fisheries, chaired by Representative Carl Moses, is to hold hearings on your report in early April. However, we would also like to see technical and peer reviews completed before that time, and these will probably depend on how soon we can get all of the above products. I would appreciate your assistance with this. Please let me know as soon as possible if you foresee any problems with this. Again, thank you for all your efforts in this project.

Sincerely,


Molly McCammon

cc: Dianne Bischak
Joshua Greenberg
Keith Criddle
Jeff Koenings
Kurt Schelle

Alaska State Legislature

Representative Carl E. Moses



CHAIRMAN
HOUSE RULES COMMITTEE

CHAIRMAN
HOUSE SPECIAL FISHERIES COMMITTEE

MEMBER
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PHONE: (907) 581-1234
FAX: (907) 581-2875

MEMORANDUM

TO: Mark Herrmann

FROM: Molly McCammon *Molly*

DATE: March 2, 1993

RE: Enhancement review study

Thank you for responding to my letter so promptly. I will get back to you as soon as I can regarding the questions you have on several of the requests. In the meantime, I wanted to assure you that you are not **required** to re-write any reports following peer review. In fact, we would have liked to have sent the report out for technical review before it was released except for 1) an earlier draft had been given to a reporter who indicated he was intending to do a story on it. We didn't want to see a press story on something that wasn't a final copy of the report. and 2) we had an increasingly awkward situation with the old legislature - and legislative committee - having been disbanded, and Senator Eliason having retired.

I have been told that to do an adequate technical review, we need work products #3 - 8. I'll look into your questions regarding 5, 7 and 8 and get back to you as soon as possible.

Thanks for your help, Mark.



UNIVERSITY OF ALASKA FAIRBANKS

School of Management
Fairbanks, Alaska 99775-1070

March 2, 1993

Molly McCammon
Alaska State Legislature
Capitol Building, Room 204
Juneau, Alaska 99801-1182

Dear Molly McCammon

Thank you for the memo of February 25, 1993. First, I would like to state that this memo is for the purpose of exchanging information between us and that it is in no way contractual in nature. I appreciate the amount of work that you are putting into this project and any antagonistic tone this memo may take is not directed at you. First, I did not receive your memo until March 2, 1993. I was out of town the prior week delivering a paper at the Western Regional Science Association Conference. I will produce documentation of the meeting if needed. Therefore, I could not respond to you by yesterday, your due date for verbal comment. In fact, if it was not for the urgency of the response I would not be writing this letter since all of my salmon work is at my house where I did the modeling.

I cannot tell you how much time this project has taken. I believe we more than fulfilled the spirit of the contract. If it had not been for additional Sea Grant funding the project would not have been possible. As it was the out of pocket expenses for me, personally, far exceeded the amount of salary I took. Nonetheless, since the letter of the RSA seems to be binding here I will try to fulfill it the best I can. Because I do not have the RSA in front of me I will not be able to, at this time, comment explicitly on any of the points you made in your requests, and because of the line, "the RSA calls for some additional work products that have not been received in final form by the Legislature. Without them, our accounting division will not authorize final payment.", I will make some general comments.

Boyce has decided to take comments 1, 2, 3, 4, 5, 6, 16, and 17. I have decided to take the remainder. When I say I below it means Greenberg and myself. However, I absolve Greenberg from any further responsibility in this matter.

Specific Comments

5) I sent a copy to Ginny Fay before the mid-February deadline. I was promised comments by Kurt Schelle and Jeff Hartman well in advanced of this due date. I talked to Kurt on the phone and his comments were minimal. Jeff Hartman did not send me his comments until March 1 1993. He specifically told me, well in advance of the due date for the complete report, that he, would get them to me. He did not make the due date. He also had promised me earlier an article on forecasts of aquacultured salmon numbers. I was going to update the model with them. I asked him three times for these. He never sent them. Given that one of the criticism of this study was that it was not peer-reviewed I find it very disturbing that the FRED division would not follow up on their promise for an initial peer review after it was offered. It would have been helpful to have their review before our report went out, as promised. I am not now willing to incorporate FRED's criticisms and redo the report. I have delivered the final report, despite the

lack of cooperation by FRED, and now consider it finished. I would like to add that Ginny Fay was a real pleasure to work with throughout the process and always kept her part of the contract. She acted with extreme competence and professionalism. The same goes for the State Legislature.

7. I am unclear what you want. Do you want to see a stream of numbers? What do you mean by mean weights? The Alaska numbers come from the State's hatchery survey and the wild ones from CFEC.

8. First, I do not know if I have a copy of this. I thought this memo was just going to be used to make our subsequent phone conference easier. I did not know that it was to become part of the required product.

9. We will need to discuss this further. I will be happy to send the code but I do not have the time to document it now unless it is required in the RSA. This package was mainly written by Mittelhammer, with input from myself. As far as I am concerned he has complete property rights to it, just as SAS has property rights to their package.

10 - 12. I need to find a copy of the memo to see if I really made a binding offer. The biggest problem here is that my SAS account ran out. Actually, I was borrowing SAS from another agency to finish a project I was doing for them. I do not currently have enough money to purchase PC SAS myself. Therefore, although I could write in code by memory I cannot produce a log file. I have not had time to make the model more user friendly. Instead, I am in the middle of completely overhauling the model to include all the individual regions in Alaska and will continue to do so when I am able to purchase SAS. This bypasses the necessity in the earlier version to have a "rest-of-Alaska" region. I will reread the RSA and fulfill the letter of the contract as far as the documentation goes. I will try my best to answer your questions but you should realize that I am currently teaching 9 units (5 days a week) and other phases of my University work have suffered because of the intense nature of this project.

13. This depends, it probably takes about 10 minutes for one simulation to run on a 486 33mhz 16 ram computer but probably an hour to get the data into shape to run on Boyce's B/C program. I could fix this to make it faster and easier to get the data but cannot do so in a timely fashion (this is not an offer at this point).

14. I will although, again, without SAS verification, I cannot guarantee that they are absolutely the correct files. It will, however, be easy for you to verify.

15. Again, I did not know that this memo was binding. I will need to get a ruling on this.

Again, I apologize for not being able to more fully answer your concerns. If I have erred in any statement because I did not clearly remember the RSA then I apologize. I wanted to answer you quickly since I am past the deadline. This weekend I will gather up the RSA and any paper work that I can find on this project to try to ascertain the requirements. I am committed to fulfilling the RSA but at this time I am not committed to going beyond the letter of the contract. I am concerned that you expect reports to be written after you receive peer review. I do not believe that this is part of the contract. (If I am required to rewrite after peer review is in then I will need to mention that I believe I was too generous with the pink scenario because the Russian factor was not taken into account. This would not seriously affect the other species.) I am also concerned of any continued FRED participation in this project. I have just heard that they widely distributed a long list of criticisms of the project. If this is the case then they have clearly displayed a bias about the project. I would find it extremely difficult to work with them and to remain unbiased about the results, as we have throughout the study.

What I suggest is that after I read the RSA that we write up a new contract for the remaining portion of the work that you feel has not been done. I request that Ginny Fay is present throughout the negotiations. (If necessary, I can solicit the university lawyer to make matters go more smoothly, although I would rather forego the hassle) In this way we will both be protected. Let me know what you think.

Again, I really appreciate the work that you are doing. Good Luck.

Sincerely,


Mark Herrmann

cc. John Lehman
Dean, School of Management

Carol Lewis,
Chair, Natural Resource Department

Bob Logan
Chair, Department of Economics

Dianne Bischak
Joshua Greenberg
Keith Criddle
John Boyce

**UNIVERSITY OF ALASKA FAIRBANKS****School of Management**
Fairbanks, Alaska 99775-1070

March 3, 1993

Molly McCammon
Alaska State Legislature
Capitol Building, Room 204
Juneau, Alaska 99801-1182

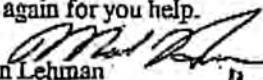
Dear Molly McCammon

Thank you for the response memo of March 2, 1993. I would like to request a favor. I cannot find the original RSA for the demand portion of the study. I would appreciate it if you could fax it to me then send me a clean copy. I have found the proposal that I wrote which was accepted by the state. I am told by University officials that this is the contract that is binding since it was accepted by the state. However, I was also told that I would need a legal ruling on it. I have not yet done so and will not be able to do so until I see the RSA. I will comment on what I believe are the unleft tasks in my (and Greenberg's) accepted proposal after I see the RSA. I also believe that I am under no obligation to answer to FRED or deal with them under any situation. I believe that the contract is with the State Legislature and you are now in charge. Am I correct? Again, I cannot do unbiased work with an agency that is so extremely biased that the only answer they will find acceptable is the one they desire.

I am faxing a copy of the cover letter I sent to Ginny Fay which accompanied the final report.

Also, I am perfectly happy to help you on with our project (areas not covered under our contract and within reason) after the contract has been fulfilled under my role as a public servant and because I enjoy and take pride in the work. I have always done this and never had a problem with any project that I have been involved with. I am always willing to answer questions or testify. However, until this contract is fulfilled I am not comfortable with doing anything on this project that is not explicitly covered under the terms of the contract. You will understand that the withholding of payment has put me in a very awkward situation in my school. Especially since the school had already forwarded the uncollected money to me to defray the costs of the project.

Thanks again for you help.

cc. John Lehman
Carol Lewis
Bob Logan
Diane Bischak
John Boyce
Keith Criddle
Joshi Greenberg
Mark Herrmann

**UNIVERSITY OF ALASKA FAIRBANKS**

School of Management
Fairbanks, Alaska 99775-1070

DATE: February 1, 1993
TO: Ginny Fay
FROM: Mark Herrmann and Josh Greenberg
Re: Finishing the Salmon Marketing Grant

I have enclosed the final report for the demand portion of the State's salmon grant entitled "An International Marketing Model for Alaskan Salmon." I believe that this fulfills all the requirements of the grant. I would appreciate a letter stating that Mark Herrmann and Joshua Greenberg have completed the demand portion of the state's salmon grant and any more information they provide on this proposal is strictly voluntary. I would appreciate it if you would send a copy of the letter to the FRED division.

I never did receive the comments that Jeff Hartman promised me on this manuscript.

Thank you for your help on this project. Good luck on future endeavors.

to: Mark Herrmann

fr: Molly McCammon

Thank you for your prompt response to our request for further clarification of final work products. I would like to restate that my request is only aimed at obtaining the necessary reasonable information that we need to quickly close out the contract. I certainly do not have any interest in a verification of your schedule as mentioned in your letter. My letter probably did not arrive with sufficient time for you to react by the March 1, and I apologize for this.

The potential for scrutiny of this RSA is greater than most, so I want to be sure to have some record that it has been appropriately completed and closed out. I think that this will be in all of our best interest. The State of Alaska is required to provide the results of the research, and any other data, notes and materials acquired from the study under the freedom of information act. At this time I am anticipating many more requests for the various study work products.

For the purposes of closing out the contract I am most concerned with obtaining final technical reports and sufficient assurance that you will work with the Legislature to get the other data and materials that have been discussed in the RSA and its attachments, and in your correspondence with Ginny Fay. I do not consider that your suggestion to involve legal council in an RSA to be an example of "working with the legislature".

In finishing these last steps I want to emphasize that I am willing to be very flexible. I am not, as your letter states, strictly enforcing the letter of the RSA. For example, my February letter conditionally relaxes some of the requirements of the RSA. For example ADF&G believes that the GAUSS software and documentation provided to them by Dr. John Boyce will probably be sufficient in lieu of the SAS software requested in the RSA. ADF&G indicated that they will notify me when this can be verified. They have a GAUSS software problem that is currently preventing the full program from running.

I believe that to our informal correspondence showing that some agreement is made regarding a description and delivery date of the remaining information would be vastly more efficient than a second contract. We have no further funds to finance such steps (with the exception of ADF&G's expressed interest in financing modest disk storage costs for the fishing cost model data files).

I also want to clarify what appears to be 2 other misunderstandings.

- o Near the end of your March 2 letter to me you refer to the possible rewriting of your manuscript after a technical review that the State is planning to obtain. I just wanted you to

know that you are under no obligation what-so-ever under this contract to carry out any further re-writes related to that review. We are simply trying to get further clarification of some methodological and statistical procedures used in the studies, that the in-house technical review team was not able to fully understand.

- o The other possible misunderstanding is which work products are needed soon for the technical review, and what can wait till later. The following work products needed soon from my February 25 letter are: 3,4,5,6,7, and 8.

Specific Comments (corresponding with your letter of March 2, 1993.

5.

A. I do not see that Hartman response to your request for comments has any bearing on my current request for the final report completion date. My letter did not indicate any link with other professional reviewers comments, or requirement for you to update the models. I simply wanted to know when you could reasonably complete and send a final report? I was not aware that you sent a final report to Ginny Fay in February, and it would be helpful to obtain another copy. We have had a number of requests for it.

B. My February letter did not indicate that we expected you to make any further updates of the estimation or simulation models prior to producing a final report. Mr. Hartman sent me a page from the article that he referred to during the formal technical review process some months earlier. He mentioned that he has not faxed the article because he had not been able to locate the other pages, thought you knew which periodical and issue it came from, and was not told that it was holding up any of your further work.

7. Mean weights

A. for hatchery fish.

Are you saying that you projected total weight for each aggregation of enhanced fish in the non-intensely modeled sites is the product of the mean weight number and number of fish reported in the electronic files of the survey data? If so, many operators are interested in seeing the actual production numbers and mean weights used. If you have a spreadsheet, or other file that identifies what the production numbers (by species) and mean weights that were that made it into the final simulation we would like to have a copy of it.

B. for the wild stocks

Your note says that the numbers for the wild stock projections (non-intensive production) came from CFEC. CFEC, however is not in the business of projecting future mean weights of salmon. If you used some mean from historical catch and lbs data, all that I am asking for is actual number for each of 5 salmon species in each region that you used. I believe that this is only 25 numbers. If the projected harvest was computed from a historical CFEC series that was expressed in pounds, then we would like to have a file of the total pounds by species and region.

8. The memo is not cited by name in the RSA as a work product, we are only asking as a courtesy, for you to send us a clean copy. The memo, and its several attached pages, has important clarifying information about the study results that are not in the reports.

9. The documentation of the estimation procedure code (not to be confused with simulation procedure) is not required by us, and was not indicated as a requirement in my letter to you. We only want to have a record of the code being produced as a work product that was paid for by the State of Alaska. We do not have any intention of obtaining any exclusive rights to any part of the code (or any other part of the study). We were not made aware that any part of the code or software used to produce this project was proprietary. We do not plan to distribute the code beyond the State of Alaska, unless someone requests it under the freedom of information act. If the Stat package in GAUSS is truly proprietary we need to know this, and also need to know how to legally obtain it.

With respect to the SAS log file, if you do not have one available from a previous simulation and it is too difficult to provide another one in the next 3 weeks then ADF&G will carry out their review of the simulation model without it.

10-12 and 15. The memo of Dec 6 does indicate that you are going to send the final version of the SAS model to the Legislature following further refining and making a more user friendly software. From page 2 "I do plan to make the model much more user friendly, I also plan to rewrite the larger report with the new model's results for Sea Grant. I would be willing to give you the new models which should be immensely easier to run. I plan to have it done in the next six months or so." Your letter indicates that you would be carrying out these refining steps subsequent to this project. It has been the Legislatures stated intention throughout this study that useable simulation software would be constructed for the CBA simulation model and Demand model as part of the contract. The CBA simulation model, however, is not much use to anyone without the ability to vary the production variables in your demand model and create new price output files.

If something has changed, and you must withdraw your offer to follow through with the transmitting of updated and clearly commented then please let me know. All I am looking for is a commitment to provide the final simulation program when you would have time to complete it, with good comment statements, and a tutorial if necessary. A timetable for the completion would be appreciated.

13. Thank you for the estimate. ADF&G thought it would take several hours to complete a simulation for a single case.

14. Question answered, thank you.

Final Comments:

I do not know how to respond to your reservations about working with FRED Division. I think that FRED Division is genuinely interested in your research, and is committed to experimenting further with the simulation models. It would be far easier to achieve the stated goals of this contract if you would continue to interact with them.

cc:

John Boyce

Keith Criddle

Joshua Greenberg

Memo

to: Bruce Twomley
Commissioner
Commercial Fishery Entry Commission
8800 Glacier Hwy. Suite 109
Juneau, Alaska 99801

from :Ms. Molly McCammon
Special Assistant
Representative Carl Moses
Alaska State Legislature
State Capitol, Room 204
Juneau, AK 99801

I would like to first express my appreciation for your assistance in carrying out the RSA on the economic analysis of the Alaska Enhancement program. Dr. Kurt Schelle, and Dr. Ben Muse of your staff has been very helpful in reviewing the work products. The efforts of other CFEC staff who supplied the data to the contractors are also appreciated.

Due to the nature of the findings, and the uncertainty surrounding some of the techniques and point estimates, the Alaska State Legislature feels that it would be advisable to solicit further technical comments. Since CFEC is the formal contracting agency for the study, and you are not likely to be affected by the results, we would again like to impose on you to administer a small Professional Services Contract to obtain an impartial review. ADF&G will be paying for the review, as they feel that the studies need further attention.

I want to clarify that we want a high quality and impartial technical review and that the selection of the contractor and framing of the final questions would be up to you. So that the burden of the work for you is minimized, the attached Draft Authority to Seek Professional Services has been attached. This PSA draft seemed to frame the questions to the contractor in a manner that seems reasonable. Again, please substitute any final wording for the document that you feel is appropriate. ADF&G has made contact with one potential contractor James Wilen who has expressed interest in carrying out the technical review. Some of the draft technical documents have been forwarded to him with the attached letter. Your further consideration of our proposal would be appreciated. I may be contacted at 465-6848.

cc:
Jeff Koenings



UNIVERSITY OF ALASKA FAIRBANKS

School of Management
Fairbanks, Alaska 99775-1070

March 9, 1993

Molly McCammon
Alaska State Legislature
Capitol Building, Room 204
Juneau, Alaska 99801-1182

Dear Molly

Thank you for sending me the copy of the original RSA for the salmon demand portion of the study. It was very useful in answering my questions as to what is left to be finished on the rest of the demand portion of the salmon enhancement project. As promised, I spent this weekend reviewing the paper work on the grant. I would like to address your concerns for the fulfillment of the contract in the following sections.

1) The contract that I had and continue to have on the salmon enhancement project is with the Alaska State Legislature.

This is clearly stated on the last paragraph of page 2 of the RSA. In addition, it states that the contacts are Ginny Fay and Molly McCammon. The initial State contacts, until the beginning of 1993, were exclusively with Ginny Fay. Now I believe the working contact with the State is Molly McCammon. Therefore, we are not, in any way, bound to answer to the Fisheries Research and Enhancement Division of ADF&G (or what ever form it has taken) and any attempt on FRED's part to negotiate or alter the remainder of this contract is unethical and illegal. As a point of fact, I believe that I have never had any dealings with Jeff Koenings or Bob Clasby since the contract was granted. However, Jeff Hartman of FRED was very involved in the development and direction of the study. I want to state that despite FRED's lack of jurisdiction in the project that we were very liberal with the amount of influence that FRED had in the project including using their suggestions on how to form future estimates of wild salmon harvests, etc. Realizing now that they had preconceived results that they wished to have confirmed by the study, and that this is in serious conflict with the scientific method and unbiased research, I feel it was a mistake to let the FRED Division have so much influence in this study.

2) The remaining contract that is binding is the November 4th, 1991 proposal written by Herrmann and Greenberg entitled "An International Supply and Demand Equilibrium Model for Alaska Salmon."

Two proposals were written in response to the State's RSA on the four parts of the study: the demand portion; the cost portion; the cost/benefit portion; the biological model portion. The first proposals were written in cooperation with ISER. At a meeting in Juneau with ISER, CFEC, FRED, and the State the proposed joint research with ISER fell apart when it became apparent that the economists from UAF and ISER were not going to be able to cooperate on this study. Subsequently, the State asked both the economists at UAF and ISER to submit separate proposals. (Please see the enclosed proposal from Greenberg and Herrmann for the demand portion). This was the proposal that the State accepted for the demand portion without revision or comment.

As part of this proposal the project's objectives, 1-13, were clearly laid out on pages 1-2. These are the objectives that we submitted and the ones that we stated that we would fulfill if we were granted the project. They **do not** include all of the objectives of the original RSA and, because of this, we were at risk of not receiving the grant. (It should be noted that ISER's proposals also did not include all of the terms of the original RSA.) However, since this is the proposal the State accepted, this is the proposal that is binding for the contract.

There are two additional pieces of evidence that the intent of this proposal was to alter the wording of the original RSA. On page 12 there is a section entitled "Deviations from the original RSA/RSP)". This heading clearly indicates that this proposal, if accepted by the State, did not strictly follow the letter of the original RSA. While this section does not include all changes, it points out some of the more important ones that I had discussed with Ginny Fay and Jeff Hartman. Again, the projects objectives on pages 1-2 include the products that I promised.

The second piece of evidence is the cover letter accompanying the proposal dated November 4th 1991 (see attached to the proposal). The third line first paragraph states that "This proposal will attempt to meet as many of the demands laid forth in the October 3rd request as possible." The line is further evidence that the proposal was the binding contract (if accepted) and that the original RSA was not. Further, the first line of the third paragraph states "I am also pleased that the legislature will consider the extension of the original time deadline for the completed work." This is evidence that the original RSA had already been altered.

With the state accepting this proposal, clearly the binding contract is the proposal written by Herrmann and Greenberg. Additionally, Senator Eliason's office sent a letter explaining why this proposal was chosen over ISERs. This is evidence that there were two separate proposals and ours was chosen.

3) Given that the binding contract can be defined in terms of the proposal's projects objectives on pages 1 and 2, there is only one area that has not been completed

I will review the project's objectives one by one. I will start with the ones that have been fulfilled.

1) To update the existing international econometric salmon model as published in a work by Mittelhammer, Herrmann, and Lin for the National Marine Fisheries Service entitled An Economic Analysis of World Salmon Markets: Effects of Salmon Farming, with 1989 and 1990 data added (and possibly 1991). Quarterly variables would again be used (Also see Herrmann 1990).

This was done. Most of the equations used data up to 1991.

2) To examine the possibilities of changing the functional form of the relevant equations in the above models to linear (or log-linear) instead of double-log to allow for changing elasticities along the demand curve.

This was done. This was a major improvement in the exvessel equation specifications.

3) To disaggregate the salmon species into chinook, sockeye, chum, pink, and farmed Atlantic salmon. An effort will also be made for coho salmon but coho salmon was not separated out in the U.S. export statistics until 1986 and may not be possible to model successfully. If coho salmon cannot be modeled successfully as an internationally traded commodity, an approach similar to Boyce's "A comparison of Demand Models for Alaska Salmon" will be undertaken for coho.

This was done in bloc 2. Also, there was no problem with coho salmon.

4) To expand the model to include canned pink salmon, and if possible, canned chum and/or sockeye

Canned pink and chum were included directly, canned sockeye indirectly.

5) From the existing model to separate out Canada and the U.S. as separate salmon producing regions

This was accomplished for farmed salmon. For wild salmon the model performed better when the two countries were aggregated in bloc 1. However, separation was made in the simulations where an individual countries supply was needed to be simulated separately. In fact, the distinct regions were Alaska, the rest of the U.S., and Canada. This was the intent of objective 5 and it was fully satisfied.

6) Report all relevant own-price, cross-price, and income elasticities. Cross-price elasticities will be between relevant Pacific and farmed salmon species.

Done. (See final report)

7) To do this modeling at the exvessel and export levels. If the data looked reasonable, the wholesale level would also be modeled. At the very least the factors affecting the wholesale level would be included in the reduced form exvessel equations.

Done. (See final report)

8) To perform sensitivity analyses over the historical time period to validate the models and to answer questions as to the effects of Cases 1-9 and 11 over the historical time period. Case 10 would be examined if the coho salmon demand could be modeled successfully. Sensitivity analysis would also be done on various market factors such as changing exchange rates tariff rates, income levels, etc. This sensitivity analysis may be performed independently of the entire demand, cost, and biological model, or may be done exclusively as a part of the final integration of the three models.

Done, including coho salmon (case 10) (See final report)

9) To relate the aggregate North American price of salmon to the regional prices of salmon in Alaska through correlation analysis in an attempt to locate regional price changes.

Done for the specified regions of Prince William Sound, Cook Inlet, Kodiak, and Southeast Alaska. In addition, the rest of Alaska was modeled. (See final report).

10) To predict Alaskan salmon prices for as long as the model seems reliable. These predictions would be made on assumed levels of market variables and would also be presented with sensitivity analysis.

This was done for the 15 years specified although I note that the last 2 years of predictions may be of lesser reliability than the first 13. (See final report).

11) Cases 1-9 and 11 would then be examined in regard to future prices.

In actuality I did cases 1-11 (see final report). I reported that all cases went well with the exceptions of cases 2-4 in which I deemed the results to be so unreliable that they should not be used.

13) To write a final report as specified by the RSA/RFP

Done, (see attached cover letter). Again this was done by the agreed upon data with Ginny Fay. To reach the agreed upon completion date we could not use the promised FRED's peer review which had been promised several months earlier on the draft.

4) There is only one objective that has not been met.

12) To Program the past and future simulation programs into SAS and document it for easy use

There has been a good faith attempt on our part to meet this objective. After the project was finished I realized that the SAS simulations were unbelievably complicated. I also realized that they were very difficult to run. I was worried that, under the current situation, it would be very difficult to document them, as they existed, into "easy use". Therefore, I suggested to Jeff Hartman that I send him the programs for the Base scenario and see if I could verbally walk him through a simulation to match the simulation I sent him on hard copy. I also jotted down some hand written notes. This exercise was not met to substitute for (12) above but was meant to facilitate an initial smooth transition of the simulation program to FRED. I wanted to make sure that the data sets I created were compatible with their computer systems since SAS can be a little tricky sometimes.

Jeff and I agreed that this would be OK for a start. Once again, it was like send sending part of the project into a back hole. I never did hear if the programs I sent were ran. When I finally did hear from Jeff, well after I sent him the computer files, he suggested that he might come to Fairbanks to video tape me running the models on my computer in lieu of the written documentation. At the time I thought this was a good idea and I agreed to it. However, I did not realize that the rest of the money on the contract would be held back until this was completed, not did I realize that additional demands (in addition to the proposal) would be put on the project. I also did not know at the time that the FRED division would take such an adversarial position to the research, distancing themselves from the research in which, to a large extent, they directed and oversaw. I now do not believe that it is possible to work directly with them due to the conflict of interest that I mentioned in my last letter. I withdraw my offer to let Jeff Hartman video tape the model runs.

I also realize that I am in a difficult position on this matter. I had verbal commitments with FRED but they were in no way the legal contractors. So any commitments I had with the FRED division are legally invalid. In essence, the solution to promise #12 was delayed by FRED but the researchers at UAF are now responsible for the consequences.

5) The solution to objective 12 (page 2 enclosed proposal) is the only contractual obligation in the demand portion of the salmon demand proposal which has not been satisfactorily met.

This is not going to be an easy task. We have been placed way behind schedule on this objective because of lack of cooperation on FRED's part and a lack of understanding on our part on who we were suppose to answer to. I will take some responsibility for this.

After the phone conference with CFEC, FRED and the State in December, 1992 Ginny Fay warned me that I no longer had to talk to or answer FRED's demands. Unfortunately, I continued to allow FRED's interference in the project. For that I am responsible. For this reason, I am willing to come to a mutual agreement on the best way to fulfill objective number 12 that will be agreed upon by the State and ourselves.

6) A satisfactory solution to objective #12 must be specified.

It will be up to both parties to find the best way to meet objective 12. I am willing to meet the objective exactly as it is stated. I am in the process of spending my own money to purchase SAS. I can start to write documentation that will allow the SAS user to run the simulation models exactly as I ran them up to the point that the data is ready to be used in the cost/benefit simulations. I will need to assume that the user is as familiar with SAS as I am. I believe this is a reasonable assumption to make. This will make the program "easy to use". However, it will be extremely time consuming to do anything with it.

I would rather take the time to reprogram the simulation to be more time efficient and straightforward. However, this will take a lot of time on our part and I would not have time to look into it until school was let out in May. I did not promise this in the proposal but would be willing to do it to help the ease of running the model. However, I am not willing to wait on the money to be forwarded to the University as I am now personally responsible for it. In addition to rewriting the model, I would document it and be willing to personally show a non-FRED individual how to run it in Fairbanks or Juneau as long as the trip was paid for. I would also be willing to lend additional support for as long as it takes.

In absence of receiving additional time to do this and in receiving the rest of the grant money I assume that the first solution of me now writing documentation to what I currently have is the preferred solution. My understanding is that once cases 1-11 can be duplicated from my directions, and the data can be put into a form to run the cost/benefit analysis, then objective 12 would be satisfied and I would be released from any further obligation from the state on the demand portion of the study since it would be fully satisfied. If this is the solution you want, let me know and I will fulfill it.

7) Because of your memo dated February 25, 1993 I desire a new contract, that voids my old proposal, stating the terms to fulfilling objective #12 and, therefore, the demand portion of the analysis.

I believe this is best for the protection of both parties. When this is drawn up I will exercise my right to run it by the University lawyer.

8) Until the salmon enhancement contract is fulfilled and the money is paid I am not willing to do any additional work or answer any additional questions regarding the project which was not specified on the accepted proposal.

This is, again, a protectionary measure and should not be viewed as the unwillingness on my part to cooperate. I am very proud of the work that we did and want the State to be able to fully examine it and use it if so desired. I have never had a problem with a granting agency before this. I have successfully performed 6 previous grants and 2 consulting projects before this one. In every case the relationships between myself and the granting agency has been extremely friendly and courteous. In all cases I answered questions well after the final papers had been signed off. Josh and I have had a very good working relationship with ADF&G (commercial fisheries division) examining potlifts for crab vessels. This working relationship has been mutually beneficial and cordial. I do not understand why this contract degenerated so quickly and into such a legal matter. Although I had always planned to work on the project, free of charge, long after it was concluded I am not at this time able to do so or willing to make any promises as such.

9) Finally, I hope that once the legal portion of this contract is fulfilled that we can enter a period of cooperation where the issue of salmon enhancement take precedence over our individual concerns and that we can examine this problem in a spirit of friendship and mutual respect among all parties.

I hope, once the legal matters of this contract are fulfilled, that the parties will be able to again establish a working relationship and that we will be free to continue to work with the state in providing useful information on the salmon enhancement project. I have never let my involvement with a project end after a contract expired. It is very important for me to continue work on important issues that have end-user groups. That is why I am in this profession. However, I am personally responsible for the money that has not been received by the School of Management and feel insulted that after all this work we have done and the obstacles we faced which were put in place by FRED, that the State is claiming we are negligent in fulfilling the contract. I also take exception to the additional demands placed by the State on the project that were not on the original contract but were stated needed to be accomplished before the rest of the money is paid. Again, I may be happy to answer the additional questions but not under the threat of not receiving payment for work performed.

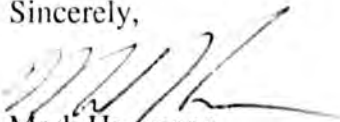
Finally, I want to thank all the wonderful people that have made the work possible and that I look forward to a continued working relationship with them. Ben Muse, Kurt Schelle and Elaine Dinneford are extremely pleasant and helpful people to work with and Alaska is lucky to have them. Ginny Fay is one of the most intelligent people that I have ever met and always operated under a atmosphere of complete professionalism. And finally, if it had not been for the funding from Alaska Sea Grant this work would have not been made possible. I look forward to future work with all these people and the

competent employees of ADF&G. Finally, I would like to thank you on your taking over this project and getting the dialogue started again. After Ginny's involvement was finished I felt like there was a long period of no communication and I was very uncomfortable with the fact that FRED was acting as if it were the contractors.

10) In Conclusion.

I believe we can move forward when you respond to #7 above. Thanks for you efforts.

Sincerely,



Mark Herrmann

cc. Diane Bischak
John Boyce
Keith Criddle
Josh Greenberg
John Lehman
Carol Lewis

APPENDIX A

I wanted to continue this discussion, which is not really pertinent to the contract itself, because I am a little worried about what you expect you will get from the computer SAS program. I would like to make the following points.

First, you should realize that the computer program is extremely complicated and was done in a very short time. When I was doing my dissertation I had roughly one year to program a much simpler simulation model. For this project the simulation took about one month for a far more difficult problem. Because of this the program that I wrote is geared towards cases 1-11 and resulting in cases 1, and 5-11 performing satisfactorily.

The simulation program is extremely tricky in that it involves being able to simultaneously simulate 24 or 30 endogenous equations for 60 future time periods. The fact that Josh and I got it to simulated at all, in the extremely short time we had for the project, is almost miraculous. There is absolutely no guarantee that the model will simulate when any exogenous variable is changed. Many times I had to personally play games to "trick" the program into simulation. Much of this problem is because there are natural log operators within the program. During the intermediate gradient search steps, a variable may take on a value of less than zero. In this case, the program will crash. There is no way to document how to get a program of this nature running. It takes someone who knows what is going on to spend time sometimes many hours adjusting it.

Because of the problem that I had simulating the farmed portion of the model the future farmed values are hardwired into the final simulation. This means that changes to the farm salmon supplies cannot be examined in the simulation model. To change their values I need to run another historical simulation model noting the change in relevant farmed salmon prices. I then need to rewrite the final simulation model to accept the new farm prices. Then the final simulation model needs to be rerun. This was the only way, in this period of time, that I was able to get the final simulation model to work. I have discussed this problem with Jeff Hartman at length and gave a lecture on it when Jeff and Ginny came to Fairbanks. He will be able to verify that I told him that in the final model the farm salmon numbers could not be altered. (I can still do them myself with time but the process is a difficult and lengthy one). Bottom line, you will not be able to use this model to examine changes in farmed quantities.

For many variables, such as consumer price indices, altering the model is not as simple as finding the new consumer price indexes and plugging them in. This is because, over the model's time period, the consumer price indices (and others) changed base years. So my numbers will not match the numbers in the publications. What is necessary is to take the percentage changes each year and adjust the stream of exogenous variables. Again, this adds a further complication into the model that is not as easy as just writing a final documentation of the simulation model.

I am extremely worried about the potential misuse of the model. For instance, as we have mentioned many times that these models are only good for reasonable changes of

the exogenous variables (hence the written warnings about interpreting case 5 too literally). As you know, the regressions are based upon historical data and a casual relationship is established between endogenous and exogenous variables. Future values of endogenous variables can be extrapolated into the future from these relationships. If the values of future exogenous variables differs significantly from past values the model would be predicting endogenous variables on observations that never historically took place and are so far from reality that the predictions would be of little value. For instance, if I were to triple the sockeye landings in 1993 and ask what the price would be the answer I would get would be simply useless. The changes in the exogenous variables have to be "reasonable". What is reasonable is best known by the modeler, many times after running the simulation models and examining the predictions of all the endogenous variables to make sure that there is no bizarre behavior being observed. The unfortunate fact is that for every simulation it takes several hours (days), and sometime several iterations (with several more hours of examination for each run), to make sure that it ran smoothly. It can be very dangerous to take the results at face value. It was after about a month of intense examination that I discovered the problem in cases 2-4 in the way the model was set up. With more time I might have been able to resolve it but our time had run out.

You should also realize that this model is going to have a very short life span of usefulness. It was modeled to answer the specific questions that the State laid out as of the end of 1992. Because the salmon markets are changing so rapidly the estimated behavioral equations will quickly become out of date. They were estimated from 1982 to 1991. Already, we are seeing an unbelievable change in the markets. For instance, Chile has just become the second leading exporter of salmon to Japan. I could not develop a historical relationship between Chile and Japan (I did between Chile and the U.S) so the model can not simulate this incredible situation. I can trick the model into some kind of Chilean-Japanese scenario, by assuming that Chilean coho exports are identical to U.S. coho exports, with some work. It would be better to reestimate the Japanese equations in another year to see if a relationship could be established. In any regard, the model has already underestimated the production from Chile. (I should mention that the first criticism of the model was that I way overestimated the Chilean supply- in fact, it is just the opposite). A even more astounding fact is that Russia has just passed Canada as the world's third largest supplier of salmon to Japan. In addition Russia showed its potential to produce huge amounts of pink salmon when it produced 476 million pounds in 1991. In this model the effects of Russian salmon were completely ignored because it was not even a major factor until the model was being completed. In the future, this may have major ramifications on the pink markets depending what Russia can do in the export markets. This does not make our predictions invalid, it just states the obvious which is that our predictions are based on the historical structure of the market from 1982 to 1991 and the best available information about future market factors taken in 1992¹.

Finally, the reason that this model is so tricky to use was because the entire modeling time for the project was ridiculously short. I can't tell you how many sleepless nights I

¹Although, there are dynamic components to the model which will pick up trends such as growing or decreasing demand etc.

spent worrying if I could make the model simulate at all. The final simulations were being completed the week that the report was due. Not only did this make documentation impossible, but it also meant that the simulations were written in a way to get them to work for this particular problem only. They were not written to work for a more general set of possible simulations scenarios as I would have done if there were time. You should realize that this is one of the largest economic simulations models in the world. We were asked to do it in an extremely short period of time and for very little money. I worked every night and weekend for a year on this. We simply did not have the resources to make a model that would be easy to use and be flexible enough to use for a wide variety of simulations the way I would have liked. That is the sort of project I could have done if it had been my sole responsibility and Josh and I (along with a research assistant) would have had about three years apiece to accomplish it and a had several hundred thousand dollars. With this amount of resources, peer reviews and testing of models would have been done as the project was being accomplished. Yet, the State, although spending in excess of \$200 million on the enhancement project since the early 70s, was willing to put out very little for this study. This is even more ludicrous when it is noted by ISER that the value of Alaska salmon production is nearly \$1 billion a year. Yet we were originally asked to accomplish the terms of the RSA for \$20,000 to predict revenues for every salmon species and regions for 15 years under several alternative scenarios! We did the best anyone could have done under the circumstances, using overhead waivers, Sea Grant and University of Alaska Faculty grants to subsidize the project. I am not sure what more you could have wanted.

Alaska State Legislature

Representative Carl E. Moses

CHAIRMAN
HOUSE RULES COMMITTEE

CHAIRMAN
HOUSE SPECIAL FISHERIES COMMITTEE

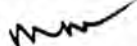
MEMBER
FINANCE SUBCOMMITTEES
FISH AND GAME
PUBLIC SAFETY

SESSION:
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PHONE: (907) 465-4451
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INTERIM:
P.O. BOX 109
UNALASKA, ALASKA 99685
PHONE: (907) 581-1234
FAX: (907) 581-2875

MEMORANDUM

TO: Bruce Twomley
Commissioner
Commercial Fisheries Entry Commission

FROM: Molly McCammon 
Professional Assistant to Representative Carl Moses

DATE: March 10, 1993

RE: Request for assistance with RSA

I would like to first express my appreciation for your assistance in carrying out the RSA on the economic analysis of the Alaska enhancement program. Dr. Kurt Schelle and Dr. Ben Muse of your staff have been very helpful in reviewing the work products. The efforts of other CFEC staff who supplied the data to the contractors are also appreciated.

Due to the nature of the findings, and some uncertainty surrounding some of the techniques and point estimates used, the Department of Fish and Game feels that it would be advisable to solicit further technical comments. As staff to both the Senate Fisheries Committee that originated this project, and to the House Fisheries Committee that will be continuing on with it, I support that position. Since CFEC is the formal contracting agency for the study, and you are not likely to be affected by the results, I believe it would be very beneficial if CFEC would be the agency to administer the Professional Service Contract to obtain an impartial review. The contract would be paid for by ADF&G.

I believe that a high quality, impartial technical review is essential. The selection of the contractor and the framing of the final questions would be up to you. However, I have attached a Draft Authority to Seek Professional Services as a possibility for your use, but feel free to substitute any final wording for the document that you feel is appropriate. ADF&G has contacted one potential contractor, James Wilen, who has expressed interest in carrying out the technical review. Some of the draft technical documents have been forwarded to him with the attached letter. I would appreciate hearing from you on this as soon as possible.

cc: Jeff Koenings, ADF&G

State of Alaska

AUTHORITY TO HIRE PROFESSIONAL SERVICES

1. Agency Reference Number

2. ASPS Number

3. Date Required for Service Execution

If required by the State Administrative Manual, this form must be executed prior to seeking PROFESSIONAL SERVICES CONTRACTS. The completed form must be part of the contract file.

4. Department <i>Commercial Fishery Entry Commission</i>		Dept. No. <i>11</i>	5. Division	Division No.
6. Service Code(s)	7. Name of Program, Project or Service		8. Statutory Authority (If Applicable)	
9. Amount this ASPS \$	10. Last Total ASPS Amount \$	11. Total Estimated Amount for Project Completion \$ <i>3,000</i>		
12. Total Projected Period of Performance (Include All Multi-Year Phases and Optional Renewals) From: <i>4-1-93</i> To: <i>4-25-93</i>				
13. Phases(s)				
14. Project Director's Name <i>Kurt Schelle</i>		Phone <i>789-6160</i>	15. Preparer's Name <i>Kurt Schelle</i>	
			Phone <i>789-6160</i>	
16. Purpose(s) of Contract (Continue on Additional Pages If Necessary) <i>See Attached:</i>				

If a solicitation effort other than competitive-sealed proposals or small procurement is anticipated, Form 02-100, Request for Alternate Procurement, must be attached and approved by the Department of Administration prior to proceeding with procurement.

CONTRACTING DEPARTMENT

Approval of this Authority is contingent upon use of the 10% evaluation point and the 5% price based Alaskan vendor preference.

17. Department Head/Authorized Representative Name	Signature
Department Head/Authorized Representative Title	Date

16. Purpose(s) of Contract

a. Project description (what is required of the contractor)

In 1991 the Alaska State Legislature commissioned a detailed economic study of the statewide salmon enhancement program under contract with the University of Alaska, Fairbanks, School of Management. The study resulted in several technical work projects and models. The primary report produced by UAF is A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. The Commercial Fisheries Entry Commission (CFEC) was requested by the Legislature to administer a Reimbursable Services Agreement with the University to complete the studies. CFEC was the preferred agency to carry out the RSA because (1) they were impartial and would not be effected by the findings, and (2) they had the best capability for producing the special computer sorts and summaries from the fish ticket file data base. As CFEC are the official owners of the numerous technical reports and other work products from the UAF studies, they are the logical agency to conduct a technical review of the studies. The legislature has asked CFEC to select a competent, independent fisheries economist to obtain a technical review of certain econometric procedures, economic theory, reports, and other review comments (developed by the technical review team for the Alaska State Legislature) for the study.

The contractor conducting the technical review will provide a comprehensive review of the economic techniques and validity of the case studies completed as part of the obligations of the UAF RSA. The contractor, for the review, will complete the following tasks:

- o Identify significant errors in the theory and methodology of the Demand, Cost, and overall CBA models.
- o Determine whether the net benefit computations in the case studies have been carried out properly and appropriately utilized the data in the demand and cost models.
- o Identify any problems with the technical reports.
- o Identify any potentially significant problems with the CBA report, such as the proper level of caution in the findings and recommendations.
- o What additional steps should be taken to verify and test the models.
- o Suggest the best approach for the State of Alaska to take to provide reliable ongoing net benefit projections for future enhancement options.
- o Answer the question: Do you think that these case studies should be relied upon for making major directional changes in the State's investment in enhancement and possibly management of salmon fisheries?
- o Review the overall comments developed by the technical review team (CFEC, ADF&G, and Legislature) from in previous reviews of the CBA, and verify which ones appear to be valid or invalid.
- o Supply any other comments or recommendations that pertain to the studies, and Alaska's use of them.

b. Why the project is needed

It is customary and prudent, in technically challenging econometric studies, or where there are significant policy implications from studies, that contracting agencies seek independent technical reviews. It is also appropriate to seek independent technical review, where the in house reviewers of the work products express some uncertainty about their own ability to interpret the findings. The UAF CBA meets and exceeds all three of these criteria.

The demand model by Herrmann and Greenberg has over 50 equations, and requires about 16 hours to estimate on a 486 33Mhz. Some of the econometric techniques used in the "block 1" estimates are new, and few economists have extensive experience with them.

Two of the four economists reviewing the contracts, Kurt Schelle, and Ben Muse possess a Ph.D. in economics, and have extensive experience in fisheries economics. They have expressed reservations about their abilities to thoroughly comment on certain new techniques used in the demand model. The technical review team spent several hours trying to unravel the block 1 and 2 estimates, and could not confidently say that the methods are or are not technically sound approaches to generating long run projections of price response. None of the economists had ever reviewed a fishery econometric model that was this nested, or used such novel statistical procedures.

Other technical questions, both theoretical and methodological, have been raised about the fishing cost and population models used in the studies. Finally, the net benefit algorithms, the summarizations of input data, and statistical significance of the Net Benefit point projections have been questioned.

All of these issues by themselves lead to the need for some independent technical review. However, the timing of the review with respect to whether it occurs before or after the studies are released appear to be a critical concern because of possible policy implication, and the high potential of misinterpreting the model implications.

A study that had severely negative implications about the future for Alaska's salmon industry, could at this time, have a strong impact on private and public sector decisions. The study could have an affect on Government policy on the enhancement program, fishery management, loans to fishermen, bycatch of salmon, marketing of seafood and the Pacific Salmon Treaty. Perceptions of private lenders and fishermen might also be impacted, along with limited entry permit markets.

In consideration of the preceeding issues it is clear that a specialized and independent technical review should occur.

c. Objectives

The objective of this techinal review is to determine if there is sufficient technical support within the various work products and case studies, for making major directional programs in enhancement and possibly management investment?

d. Tangible (measurable) benefits

The technical review will aid the Legislature and other policy makers in determining what level of confidence they should have in these models at this time. What additional steps should be taken to verify and test the models. What additional steps the state should undertake to evaluate economic consequences of changed harvest levels from enhancement or other activities.

e. Cost/benefit description.

It would be inappropriate and technically impossible to compute a quantitative net benefit from generating this review. The benefits, of the review would be the increased probability that government will not misuse information that they have received. We think that the information gained from the review will provide an important check and balance for the State of Alaska's near term decisions on commercial fishery enhancement.

f. Project schedule.

- Feb 15 Send out draft study materials to potential contractors for preliminary cost estimate.
- March 15 Receive final work products from UAF researchers (relevant to this review).
- April 1 Send out final versions of all work products and comments that the contractor requires for the technical review.
- April 15 Draft review comments to be received by CFEC
- April 19 CFEC questions (on review comments) communicated to Contractor.
- April 25 Final report. Contract complete.

Alaska State Legislature

Representative Carl E. Moses

CHAIRMAN
HOUSE RULES COMMITTEE

CHAIRMAN
HOUSE SPECIAL FISHERIES COMMITTEE

MEMBER
FINANCE SUBCOMMITTEES
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PHONE: (907) 581-1234
FAX: (907) 581-2875

March 10, 1993

Mark Herrmann
School of Management
University of Alaska Fairbanks
Fairbanks, AK 99775-1070

Dear Mark:

Thank you for your March 2 response. I have FAXED and sent hard copies of the RSA and your proposal for your use. You should have them by now. According to Ginny Fay, these are the documents that have been relied upon for this project. I really don't believe we need to negotiate a new contract for any new materials. Instead, I think between us, we can figure out what other materials we can reasonably expect from you and Dr. Boyce to complete the entire project. The RSAs for the entire project will quite possibly be closely scrutinized. Under the Freedom of Information Act, the Legislature would be required to provide the results of the research and any other data, notes and materials acquired from the study.

I also want to assure you that we are not holding up final payment on the contract. In fact, I don't believe a final bill has yet been submitted by the University. However, in order to expedite that payment, I want to make sure that all parties are satisfied that the terms of the contract have been completed.

Also, I apologize about the misunderstanding on delivery of the final demand report. Ginny had not yet delivered it to us. We are now in receipt of that document. As I mentioned in the March 2 memo I FAXED to you, there is absolutely no requirement to re-write any of your reports.

Fish and Game has provided me with further information concerning the requests in my February 25 memo. As I mentioned before, in order to do an adequate technical review, I have been told that we need work products #3 - 8 as indicated in that memo. ADF&G believes that the GAUSS software and documentation provided to them by Dr. John Boyce will probably be sufficient in lieu of the SAS software requested in the RSA. They will notify me when this can be verified. They apparently have a GAUSS software problem that is currently preventing the full program from running.

Apparently there was some confusion about the article you referred to on forecasts of aquacultured salmon numbers. Mr. Hartman mentioned that he had not sent you that article because he had not been able to locate the other pages, but thought you knew - or might know - which periodical and issue it came from. He was not aware it was holding up any work. Anyway, that issue is moot since your final report is completed.

#7 Mean weights

- for hatchery fish.

Are you saying that you projected total weight for each aggregation of enhanced fish in the non-intensely modeled sites is the product of the mean weight number and number of fish reported in the electronic files of the survey data? If so, many operators are interested in seeing the actual production numbers and mean weights used. If you have a spreadsheet, or other file that identifies what the production numbers (by species) and mean weights that were made into the final simulation we would like to have a copy of it.

- for the wild stocks.

Your note says that the numbers for the wild stock projections (non-intensive production) came from CFEC. CFEC, however, does not project future mean weights of salmon. If you used some mean from historical catch and lbs data, what is the actual number that you used for each of the 5 salmon species in each region? If the projected harvest was computed from an historical CFEC series that was expressed in pounds, could we have a file of the total pounds by species and region?

#8. You're right, this memo is not considered a work product. However, it apparently has some important clarifying information about the study results that are not in the reports, and it would be helpful to have a clean copy.

#9. Documentation of the estimation procedure code (not the simulation procedure) is not required. Apparently, all that is needed is to have a record of the code being produced as a work product for the state. There is no intention to obtain exclusive rights to the code, and no one at Fish and Game knew that the code or software might be proprietary. If the Stat package in GAUSS is proprietary, could you please let us know, and how it might be legally obtained? Again, if there are any problems with this request, I would be happy to discuss it with you.

With respect to the SAS log file, if you do not have one available from a previous simulation or it is too difficult to provide another one in the next three weeks, then ADF&G will review the simulation model without it.

#10-12 and 15. The memo of December 6 indicates that you were intending to send the final version of the SAS model to the Legislature following further refining and making it a more user friendly software. In your memo, you stated: "I do plan to make the model much more user friendly. I also plan to rewrite the larger report with the new model's results for Sea Grant. I would be willing to give you the new models which should be immensely easier to run. I plan to have it done in the next six months or so." Your letter to me indicates that you may no longer be doing this refining. It's my understanding that in order for the CBA simulation model to be used by someone else, they would need to have the ability to vary the production variables in your demand model and create new price output files. If this is not a reasonable request, or you have some other thoughts, please let me know.

#13. Thank you for the estimate. ADF&G thought it would take several hours to complete a simulation for a single case.

#14. Question answered, thank you.

I'm not quite sure how to respond to your reservations about working with the FRED Division. Unfortunately, Ginny Fay was the person who acted as the intermediary between all of us involved in the

economic studies, and she is no longer on contract with us. I'm not really in a position to assign blame for what appears to be a breakdown in communication. However, I can assure you that the Legislature - and ADF&G - are still very interested in your research and in continued work with the simulation models. I would urge you to somehow resolve, if at all possible, whatever problems have developed during the course of this project. If I can be of help, please let me know. I feel like I'm very much caught in the middle on this. However, I remain committed to the entire enhancement review project, and want to make sure that all of the information we have contracted for is easily understood and is in a form for current and future use. I appreciate your help with this effort, Mark.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Molly'.

Molly McCarron

cc: Jeff Koenings
John Lehman
Carol Lewis
Bob Logan
Dianne Bischak
Joshua Greenberg
Keith Criddle
John Boyce

Please Give this to Molly McCammon
From Jeff Hartman

Progress Report on Gauss version of CBA model sent by John Boyce.
by Jeff Hartman
3-11-93

Jim Blick (a biometrician in comm fish) and I have spent considerable time to purchase software and get the CBA model running. We have had (2) 1 day work sessions on the CBA software over at the regional office. Initially had problems getting it to run because Boyce used a different and incompatible version of GAUSS. We then updated a version that Comm Fish had and now can fully run, edit the models, and reproduce the outputs generated in the CBA study. We have uncovered several programming questions and plan further review. To answer those questions we plan to send a list of the questions to John Boyce and then request a conference call with him. All that we can do is ask for the conference call, we have no guarantee that he will provide it. If he does, then I would not hesitate to notify you (Molly McCammon) that Boyce has fully responded to the Legislatures request for usable software and documentation. I think that Boyce, unlike Herrmann has made a sufficient effort to try to finish this specific part of his RSA/RFP obligation.

Address for Keith Criddle

Keith Criddle, Ph. D.
Associate Professor
Department of Economics
101 Bunnell Bldg.
University of Alaska Fairbanks
Fairbanks, Alaska, 99775

3-23.
questions have not been sent.

THE FOLLOWING DOCUMENT MAY NOT FILM
LEGIBLY BECAUSE OF THE POOR QUALITY OF THE
ORIGINAL

STATE OF ALASKA

REIMBURSABLE SERVICES AGREEMENT

AMENDMENT NUMBER

1

REQUESTING DEPARTMENT LEGISLATIVE AFFAIRS AGENCY	DIVISION LEG. OPERATING BUDGET	SECTION SENATE OPER. BUDGET	LOG NUMBER (ADN) 3127109-07
SERVICING DEPARTMENT DEPT. OF FISH & GAM	DIVISION COMMERCIAL FISHERIES	SECTION ENTRY COMMISSION	LOG NUMBER (ADN) 1-2-0381

I. The servicing agency agrees to provide the requesting agency with the following service(s):

PROJECT OR PROGRAM TITLE

LEGISLATIVE ANALYSIS OF THE STATEWIDE SALMON ENHANCEMENT PROGRAM

DESCRIPTION OF SERVICE(S) TO BE PROVIDED IF THIS IS AN RSA AMENDMENT, ALSO DESCRIBE SPECIFIC PURPOSE OF AMENDMENT.

TO CONDUCT IN-DEPTH ECONOMIC ANALYSES FOR THE SENATE SPECIAL COMMITTEE ON DOMESTIC AND INTERNATIONAL COMMERCIAL FISHERIES AS PART OF THE COMMITTEE'S EXTENSIVE REVIEW OF THE ALASKA SALMON ENHANCEMENT PROGRAM. SPECIFICALLY, THE RESEARCH WILL INCLUDE A WORLDWIDE DEMAND ANALYSES FOR ALASKA SALMON (\$18,000), A SALMON FISH COST ANALYSIS (\$20,000), AND A PUBLIC POLICY SIMULATION MODEL (\$10,000) AS SPECIFIED IN THE REQUEST FOR PROPOSALS DEVELOPED BY THE COMMITTEE. RESULTS OF THE RESEARCH WILL ASSIST THE LEGISLATURE IN ITS REVIEW OF THE ENHANCEMENT PROGRAM.

II. Terms and mechanics of reimbursement:

Billing Address:

☒ Payment upon receipt of interagency billing☐ Payment upon completion of service(s).☒ Other (Specify):

\$25,650 UPON RECEIPT OF INTERAGENCY BILLING.

\$22,350 UPON COMPLETION OF SERVICES.

DATE WORK TO COMMENCE

12/10/91

COMPLETION DATE

10/30/92

BILLING RD CODE: 31070

PHONE: 465-3852

III. Schedule of maximum costs to be incurred by the Servicing Agency:

	ORIGINAL AGREEMENT	PREVIOUS AMENDMENTS	THIS AMENDMENT	TOTAL
Personal Services	\$ 3,300	\$ -	\$ -	\$ 3,300
Travel	\$ -	\$ -	\$ -	\$ -
Contractual	\$44,700	\$ -	\$ -	\$44,700
Supplies	\$ -	\$ -	\$ -	\$ -
Equipment	\$ -	\$ -	\$ -	\$ -
Land & Buildings	\$ -	\$ -	\$ -	\$ -
Grants	\$ -	\$ -	\$ -	\$ -
Other (Itemize)	\$ -	\$ -	\$ -	\$ -
TOTAL	\$48,000	\$ -	\$ -	\$48,000

IV. Budgeting and accounting information:

REQUESTING AGENCY	1. This agreement is documented in FY 92 Capital/Operating budget ☒ No ☐ Yes page
2. Financial coding to be charged 31922059	Continuing funds ☒ No ☐ Yes Authority
3. Encumbrance document number RS 3127107	Continuing funds ☐ No ☒ Yes Authority
4. Date funds lapse 6/30/93	
5. Federal Funds ☒ No ☐ Yes Amount \$	
Federal Agency / Program / CFDA No. / Grant or Contract No.	

SERVICING AGENCY	1. This agreement is documented ☒ No ☐ Yes in FY Capital/Operating budget page
------------------	---

V. Approvals & Certification: The requesting agency and servicing agency agree to the terms and conditions above. In addition, the requesting agency certifies that sufficient funds are encumbered to pay this obligation or that there is a sufficient unencumbered balance in the appropriation cited to cover this obligation. I am aware that to knowingly make or allow false entries or alterations on a public record, or knowingly destroy, mutilate, suppress, conceal, remove, or otherwise impair the verity, legibility or availability of a public record constitutes tampering with public records punishable under AS 11.56.815-820. Other disciplinary action may be taken up to and including dismissal.

REQUESTING AGENCY AUTHORIZED SIGNATURE	NAME PRINTED	DATE
<i>Warren W. Endicott</i>	WARREN W. ENDICOTT, EXEC. DIRECTOR	6/19/92
SERVICING AGENCY AUTHORIZED SIGNATURE	NAME PRINTED	DATE
<i>Robert R. (Dor)</i>	ROBERT R. (DOR)	6-19-92
OMB AUTHORIZED SIGNATURE	NAME PRINTED	DATE
<i>David H. (Dor)</i>	DAVID H. (DOR)	6-30-92

STATE OF ALASKA

ROUTE SLIP

TO: Mail Station	Department <i>Legislative</i>	Division <i>Legislative</i>
Attention <i>Molly McCann</i>		
☐ Approval ☐ Signature ☐ Comment ☐ Contact Me ☐ Prepare Reply ☐ For Your File ☐ Note & Return ☐ Initial & Return ☐ Return as Requested ☐ Return for Approval ☐ Necessary Action ☐ For Your Information		
Remarks: <i>Molly - My suggestions for a final request from the rescinding by the Legislature on page 7.</i>		
FROM: Mail Station	Department <i>Executive</i>	Division <i>LFMD</i>
By <i>Jeff H. L...</i>	Date <i>3-31</i>	

02-002 (REV 3-84)

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

TO:: Jeff Koenings
Director
Commercial Fisheries Management and Development
Department of Fish and Game

DATE: March 24, 1993

FILE NO:

TELEPHONE NO: 465-4160

SUBJECT: Clearing up misconceptions
from Dr. Herrmann's 2nd letter
to the Legislature.

FROM: Jeff Hartman *JH*
Economist
Commercial Fisheries Management and Development
Department of Fish and Game

As you are aware, Dr. Mark Herrmann, an economist with the University of Alaska, Fairbanks, has sent at least 2 letters to the Alaska State Legislature laden with inflammatory statements about the Department of Fish and Game involvement in the Hatchery Research Study. In fact, Dr. Herrmann has blamed us for nearly every difficulty that he has experienced in this study. I have reviewed his two letters, the official RSA (housed in the contracts section of the Division of Administration), and the ADF&G memos which fully documented our involvement. Many of the statements that Dr. Herrmann presents as fact, are not factual, and the approach he suggests for completing this study are not, in my opinion, reasonable for the State of Alaska to accept. My response follows other clarifications and corrections that I have pointed out in Dr. Herrmann's previous letter of March 2, 1993. This previous letter was intentionally not distributed to anyone outside of FRED Division because I believed that Herrmann's criticisms were too far fetched to be taken seriously. The accumulative affects, generated this second volley, do deserve a response. My response to Herrmann's first letter, dated March 18, 1993 (attached), should be read prior to this one. I also include some recommendations for encouraging the UAF team to finish the RSA.

1. The uncooperative tone of Dr Herrmann's letter is based on his misconception that he has not been paid for his work.

From pg. 7 (letter of March 9, 1993) Herrmann states: "Until the salmon enhancement contract is fulfilled and the money is paid I am not willing to do any work or answer any additional questions regarding the project which was not specific on the accepted proposal."

Also from page 7: However, I am personally responsible for the money that has not been received by the School of Management and feel insulted that after all this work we have done and the obstacles we faced were put in place by FRED, that the State is claiming we are negligent in fulfilling the contract."

How could Herrmann be personally responsible for any of these funds when UAF received its final payment for this project over 1 month ago? According to the ADF&G Division of Administration (see attached) the final payment was made on February 13, 1993 and the check cashed by UAF on March 3, 1993.

Also, Ms. Molly McCammon made it clear in her March 10, 1993 letter to Herrmann that "we are not holding up the final payment on the contract". I do not understand his persistence in this line of reasoning. Either the communication channels between UAF accounting and the researchers must be very poor, or Herrmann is not being straight forward with Ms. McCammon.

2. Herrmann states: "The contract that I had and continue to have on the salmon enhancement project is with the Alaska State Legislature. This is clearly stated on page 2 of the RSA."... and any attempt on FRED's part to negotiate or alter the remainder of this contract is unethical and illegal."

On March 23, 1993 I obtained a copy of the official RSA that was sent to the University of Alaska. As a matter of record, Page 2 of the official RSA (log number 1121091) clearly states that the Requesting Department for this contract is the Dept. of Fish and Game, not the Alaska State Legislature as Herrmann suggests. I do not know which "page 2" Mark is looking at. On page 1 of the RSA, CFEC is identified as the payment agency. As a practical matter, all of us involved in this project know that this is the Legislature's project and that the Project Manager and contact for the researchers has been Ginny Fay. The attachments to the official RSA make this clear.

I am not sure how Herrmann concludes that FRED Division is going to "alter" the contract. The idea that some one in FRED would try to tamper with the RSA documents is simply nutty. According to Jenifer Childress (the ADF&G RSA specialist in charge of administering the RSA payments), it would be impossible for any person other than CFEC to alter the contract between CFEC and UAF. They have been under lock and key in the ADF&G Division of Administration since early in 1992. Also, according to Childress, the Alaska State Legislature can consult with anyone that they want in the course of formulating an RSA or obtaining review of the work products (as long as that person isn't a potential competitor for the RSA). She could see no legal liability or ethical standard compromised by the Legislature discussing the studies with ADF&G staff. The Legislature has stated in numerous

documents that it intended the software and other work products from this study to be designed to be useable by ADF&G. It is reasonable and ethical that they would communicate with us about this study.

3. Pg 1, last paragraph of Herrmann's March 9 letter states. "I want to state that despite FRED's lack of jurisdiction in the project that we were very liberal with the amount of influence that FRED had in the project including using their suggestions on how to form future estimates of wild salmon harvests, etc."

Herrmann implies that FRED Division suggested the approach that was finally used for estimation of wild stock numbers for this project. Nothing could be further than the truth. FRED Division has openly and formally criticized the approach used to estimate wild stock background catches. Our suggestions for a testing of different probable levels of wild stock harvests date back to the beginning of this project and are stated as a requirement in the RSA. We suggested that this deviation from the original RSA be noted in the researchers report, in the December 11, 1992 letter to Ms. Molly McCammon from Jeff Koenings.

"The original RFP/RSA explained that some simulations would be made with the assumption of a 10-, 15-, and 20-year mean background harvests of wild fish. The contractors requested the use of one background level of catches to achieve their deadline. The report should note that the project manager released them from this prior obligation and set background catches for non-intensively modeled sites at the 10- year mean."

In the September 22, project meeting at the University of Fairbanks, I voiced concern over the dropping of the three levels of background wild catch the case studies, as well as selecting the single point that represented the highest 10 year average of wild stock harvests in history. My concerns were overruled by the project manager in the interest of getting the project completed quickly. It was entirely within the project manager's authority to make this decision, but it is misleading and false for Dr. Herrmann to imply that ADF&G's suggestions in this matter have been followed. Other FRED comments such as the February 2, 1993 memo from Jeff P. Koenings to the Senate Special Committee on International and Domestic Fisheries, clearly demonstrate our concerns about the treatment of the wild stock sensitivity testing, when Director Koenings stated:

"Deviating from the original RSA's requirement for a 10, 15 and 20 year mean for background wild catches in the non-intensively modeled fisheries, leaves too many unanswered questions about how the models would behave under the likely range of future salmon population sizes.

4. Mark Herrmann states on page 2 of his March 9 letter: "The remaining contract that is binding is the November 4th, 1991 proposal written by Herrmann and Greenberg entitled "An International Supply and Demand Equilibrium Model for Alaska Salmon." He goes on to state "...the proposal was the binding contract (if accepted) and that the original RSA was not."

Mark Herrmann is **wrong** in his claim that their proposals invalidated or supplanted the 30 page RSA.

The official and final RSA logged with the ADF&G contracts section includes the specific sections that Herrmann claims are not valid. On March 23, 1993, I requested a copy of the official RSA documents sent to University of Alaska, Fairbanks from the ADF&G contract staff. This first attachment in the official RSA is called Reimbursable Services Agreement Contract Specification and Request for Proposals Software Development and Policy Analysis of A benefit-Cost Analysis of the Statewide enhancement Program (I will call this the "original RSA"). According to Jenifer Childress, the original 30 page RSA was a legitimate part of the full RSA. She was never notified that any part of it was invalid, and the Department of Fish and Game, Audit and Receivables Routing Slip says that CFEC "wanted the whole packet (including the original RSA) to be sent off to UAF". I also, had the FRED administrative officer review the contract, and she agrees with Childress that the original RSA is a binding document in the full RSA. Her conclusion is based on a reading of the Boyce and Herrmann proposals which are respectively the 3rd and 4th attachments in the packet. Jacki Sanders points out that in Mark Herrmann's memo he never makes any statement indicating that his proposal invalidates the original RSA.

She noted that Herrmann and Boyce specifically acknowledge in their proposals that they will make the best effort possible to adhere to the RSA.

Herrmann States:

"I cannot promise the successful modelling of all the areas that the RSA/RFP asks for. However, I believe that Greenberg and I can make as good of an effort to meet as much of the specific objective outlined in the RSA as any researchers can."

Boyce States:

The only part of the RFP which I feel cannot adequately be addressed is the section dealing with estimation of long run marginal fishing costs..

There are sections of the proposals that note deviations to the RSA/RFP both from Herrmann and Boyce. The inclusion of their proposals in the full RSA package implies that these deviations were accepted as part of the RSA, but does not imply that other requirements of the original RSA, not mentioned in the deviations or elsewhere in the contractors proposals would also become void. There is no other evidence in the RSA file to indicate that the original RSA is void. Even the project manager could not void it without some formal notice to the contracting officer in the Division of Administration. It would have been extremely poor procedure for the Project Manager to try to void the original 30 page RSA verbally, without some point by point substitute. I seriously doubt that what Dr. Herrmann offers as evidence for the original RSA not being valid itself would hold water if we were to show this to the AG's office.

5. Herrmann presents a few reasons on pg 5 for withdrawing his verbal commitment to have a tutorial of the simulation in lieu of the RSA's requirement for clear documentation and user friendly software when he states "I now do not believe that it is possible to work directly with them (FRED) due to the conflict of interest that I mentioned in my last letter."

- a. Herrmann's first argument for withdrawing his commitment is that he was unfairly required to carry out these steps to receive final payment. "However, I did not realize that the rest of the money on the contract would be held back until this was completed." This reason is inconsistent with the facts. Firstly, Molly McCammon did not tie the development of the software to his final payment. She, as previously noted, in her March 2, letter that she was not holding back the payment.
- b. Another argument he presents is that FRED did not try to run the simulation models or promptly respond reply to Herrmann's transmitting of the electronic files and explanations. Neither of these statements are true.

I tried, in January, unsuccessfully to run the simulation models. The reason our trials were unsuccessful, is that (1) that his code was so poorly documented with hand scribbled notes that they were not readable by anyone but Mark Herrmann and Josh Greenburg, and (2) we had a fax of the so called "documentation" for the instructions, which was also unreadable. I have included a copy of it to show how utterly illegible it actually is. Shortly after receiving the code for the models I looked it over with a David Ackley. It had a few scribbled notes, and some of the input file names were not consistent with the labels. Ackley and I could not begin to unravel it. I contacted Herrmann in Late January or early February, and suggested the tutorial solution. Ironically, my suggestion was intended to help Dr. Herrmann fulfill this part of this part of the contract without having to invest a great deal of time in documentation. He has always prefaced his conversations with me on this subject, by explaining how busy he is (how many credits he is teaching and how many hours of work he is doing a week). In February, I suggested to Molly McCammon that she ask for a clean, copy (not faxed) of the December 6, 1992 memo from Herrmann which contains the unclear documentation. Herrmann has of course refused to send it or discuss it as indicated in his most recent March 9 transmittal.

I can only conclude from my interactions to date, that Dr. Herrmann has had little interest in producing the documentation.

- c. Herrmann final reason offered is that: "I also did not know at the time that the FRED division would take such an adversarial position to the research, distancing themselves from the research in which, to a large extent, they directed and over saw".

I describe in my March 18, 1993 letter why I do not think that ADF&G owes anyone an apology for responding to formal requests for its comments made during the technical review team process on this project. It would have been illegal for us to withhold this type of public information, and the comments of the technical review team are framed in a professional manner. In contrast with Dr. Herrmann's reaction to these comments, most economists who carry out new studies are anxious to have free and open discussion about technical aspects of their analysis.

None of these "reasons" seem valid for refusing to answer basic software questions and providing user guidance required for ADF&G to operate the Demand Model software. Since FRED staff, are the only persons in the State of Alaska who have expressed interest in operating the models, Herrmann's refusal to interact with us further, effectively blocks ADF&G from a reasonable ability to ever operate the software. It also effectively blocks the State of Alaska from using the software, and I suspect that Herrmann is aware of this.

6. Herrmann states on pg. 7 of the March 9 letter: "I do not understand why this contract degenerated so quickly into such a legal matter". He previously states on page 6: "Because of your memo dated February 25, 1993 I desire a new contract, that voids my old proposal, stating the terms to fulfilling objective #12 and, therefore, the demand portion of the analysis. I believe this is best for the protection of both parties. When this is drawn up I will exercise my right to run it by the University lawyer."

In one breath Herrmann express dismay that this has degenerated into a legal matter and in the previous breath proposes to bring his legal council into yet another separate RSA. The only mention of legal advice relating to the RSA have been brought forward by Dr. Herrmann himself. Both his first letter and now the March 9 letter indicate that he wishes to bring attorneys into this matter. Molly McCammon's previous letters make no mention of obtaining legal advice and even appears to defuse the need for a second contract. I also believe that Herrmann's suggestion to develop a new RSA is not a good idea, as the first RSA is sufficiently binding and clear. He is free to choose to not complete some portions of it, or to make it unusable for others to operate.

7. Herrmann states: "After the project was finished I realized that the SAS simulations were unbelievably complicated. I also realized that they were very difficult to run. I was worried that, under the current situation, it would be very difficult to document them, as they existed, into "easy use".

I do not understand how Mark can make this statement at this time. The programming and simulations for this study was completed prior to Mark Herrmann's answer letter to Ginny Fay of December 6, 1993. At this time he had fully exercised the models, run 17 simulations, answered numerous questions about the results, and had to be aware of how easy or difficult they were to run. Yet in his letter of December 6, 1992 he states that he will be glad to refine the models and make them user friendly for our use.

Herrmann states: "I do plan to make the model much more user friendly. I also plan to rewrite the larger report with the new model's results for Sea Grant. I would be willing to give you the new models which should be immensely easier to run. I plan to have it done in the next six months or so".

I find it very puzzling that it is now too complex and troubling to create the software in a useable form and eventually guide me through its use. I do not doubt that the simulation procedures are complex and require some baby sitting to run. If Herrmann chooses not to answer our questions about the simulation models and not to present a tutorial, I do not think that we will be able to

duplicate the original enhancement cases or test any different cases. This is unfortunate since we have already gone to considerable trouble and expense to get the CBA model software running in GAUSS that was provided by John Boyce. The original RSA refers to the simulation software for the demand models, the cost model, and the overall CBA procedures as a single package. It was not envisioned that Mark would isolate his part of the simulation software development from the remainder of the software development. By refusing to make his work product as useable as John Boyce has tried to do, Herrmann has rendered the whole CBA software system virtually unusable to anyone in the State of Alaska.

My Recommendations:

Should Molly McCammon ask for suggestions of how the matter of the incomplete RSA should be resolved, I have summarized my recommendations as follows:

Herrmann's two letters were generated from McCammon's request letter of Feb 25 which asks for some reasonable output and input data and simulation software. Since the contract has been paid, I believe that **the legislature is completely within their rights reiterate the February 25 information request from Molly McCammon**, so that Herrmann understands what is requested from him. I would note that the legislature has considered and rejected the proposal for a second RSA. The original RSA and the proposals are still considered to be valid and the researchers should provide the materials requested in the February 25, 1993 letter to Herrmann from McCammon (with the following exceptions).

The following recommendations correspond with the points from Molly McCammon's letter of February 25, 1993.

1 and 2. State that, ADF&G has completed their review of the GAUSS program, and that it is an acceptable substitute for the SAS program. ADF&G will forward some questions through Molly McCammon and it would be appreciated if you would answer them in their understanding of the models. *and assist them*

3. Please complete as noted. Perhaps the spread sheet that Dianne Bischak developed for the input data will show how the data was aggregated on the hatchery production data. If so, an electronic file of it would be acceptable.

4. Please complete as noted.

5. Previously sent by UAF and received. Thank you.

6. Please complete as noted. We need a clean final version of this, not a faxed version.

7. Please complete as noted.

8. Please complete as noted.

9. You did not respond to this request, in your letter of March 9. We are still interested in obtaining information related to the estimation procedures. Additionally, an electronic SAS or lotus readable file with all of the quarterly input data used for the estimation procedures should be included. This would include all economic and biological variables and be tied to the appropriate quarter for that observation.

10, 11, and 12. Please complete as noted. We do not think that the problems that you pointed out in your March 9 memo are sufficient to prevent communications with the staff at ADF&G. We again request that you respond to questions on the software sent by ADF&G on February 28, 1993. If technically possible arrange for tutorials at their travel expense. I know of no other agency in the State of Alaska who is willing to commit the staff time to learning the software. They have already demonstrated a commitment to operate the GAUSS software. Mr. Hartman continues to express an interest in obtaining answers to his software questions and in obtaining a tutorial when you have sufficiently completed the programs.

13. Previously answered, thank you.

14 and 15. Please complete as noted.

16. Please complete as noted.

17. Please complete as noted.

Sending a reiteration of Molly's original request to both Mark Herrmann and John Boyce would also address Boyce's complete lack of response to the McCammon's transmittal. If the researchers refuse to respond to this, I am not aware of much beyond these actions that the Legislature can do.

cc:

Robert Burkett
Kevin Duffy
Johnny Holland

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

TO: Jeff Koenings
Director
FRED Division
Department of Fish and Game

DATE: March 18, 1993

FILE NO:

TELEPHONE NO: 465-4160

SUBJECT: Setting the Record Straight on
FRED involvement in the
UAF economic Study

FROM: Jeff Hartman *JH*
Economist
Division of FRED
Department of Fish and Game

I would like to clear up some misinformation about FRED Divisions involvement in the UAF economic study. The confusion was generated by Mark Herrmann in his March 2, 1992 memo to Molly McCammon.

1. Dr. Herrmann stated in the last section of his letter. " I am also concerned of any continued FRED participation in this project. I have just heard that they widely distributed a long list of criticisms of the project. If this is the case than they have clearly displayed a bias about the project. I would find it extremely difficult to work with them as we have throughout the study."

My reply:

The Alaska Department of Fish and Game has responded to only two formal requests for its technical comments that were made during the numerous technical review sessions on the UAF CBA model. We have not "widely distributed" these comments as Dr. Herrmann states. These same comments were originally forwarded to Ms. Ginny Fay in several memorandum during the 3 month review period at her request. As you probably recall, ADF&G served on an in-house technical review committee for the UAF study which included Ben Muse, Ginny Fay and Kurt Schelle. It was our job to produce good technical review comments. Many of these comments were not even raised by ADF&G but pointed out by the other members of the technical review team. Ms. Fay has stated several times that she forwarded all ADF&G comments to the researchers. This is the first time that I have heard Mark Herrmann complain about our technical and editorial comments.

Our comments have been framed and supplied to requesters, in a professional manner. We have not rushed to the press, nor have we written any cavalier press releases about these studies. I think that Dr. Herrmann has wrongly accused staff of this Division of bias. We have a deeply rooted

interest in the health of Alaska's salmon industry and believe that it is in the best interest of the industry for professional dialogue between researchers like Dr. Herrmann and ADF&G to remain open. I am concerned that Dr. Herrmann might use this as an excuse to not further interact with this Department on this project. I am hoping that he will reconsider his stated reluctance to deal with the staff of FRED Division.

While I feel that Dr. Herrmann has unfairly blasted us, I plan to keep communication channels as open as he will allow. With this in mind, I am forwarding my set of Demand model comments to Molly McCammon, which asks some questions about SAS code that Dr. Herrmann provided to FRED Division. To fulfill the ADF&G obligation to obtain the capability to run recent versions of the demand model, it would be helpful if she would encourage him to talk to us about this. I have received no response from him regarding the questions that pertain to the running of the simulation software that he sent us.

Incidentally, I would like to note that the software that we received from Dr. Boyce for the overall CBA model appears to be clear, and he evidently put some effort into making it understandable. He also has responded to one of our questions regarding the running of the program. We have to purchase a \$1,200 piece of software to run the program and are investing no small amount of staff time in learning a new software package. It is highly likely that the GAUSS version of the model will substitute for the SAS version requested in the RSA. I have now been able to get a full simulation of the model to run, but several questions remain about the code. I will be finalizing these questions for Dr. Boyce as soon as the detailed review of the code is completed.

2. Dr. Herrmann has stated in his letter that: "I was promised comments by Kurt Schelle and Jeff Hartman well in advance of this due date. I talked to Kurt on the phone and his comments were minimal. Jeff Hartman did not send me his comments until March 1, 1993. He specifically told me well in advance of the due date for the complete report that he would get them to me. He did not make the due date. He also had promised me earlier, an article on forecasts of aquacultured salmon numbers. I was going to update the model with them. I asked him three times for these. He never sent them. Given that one of the criticism of this study was that it was not peer-reviewed I find it very disturbing that the FRED division would not follow up on their promise for an initial peer review after it was offered. It would have been helpful to have their review before our report went out as promised. I am not now willing to incorporate FRED's criticisms and redo the report."

My reply:

This outburst originates from Molly McCammon's 5th question in the February 25th letter to Dr. Herrmann, which simply asks him if it is ok for him to send the final report by March 1. The letter says nothing about any obligations for Herrmann to respond to any previous comments made on the final report nor does it say anything about requiring him to re-estimate the demand model equations with new farmed salmon data. I don't know why Mark is relating the request for the final report that he said would be complete in Mid February to my comments.

A. In January of 1993, Ginny Fay told me that any comments that I or CFEC made to any of the researchers from January on would specifically be professional to professional, and not binding through the contract. I was surprised when Marks reply indicated that he might need to incorporate

these comments to be in compliance with the RSA. As you can see, my technical comments were on the demand model were very minor, and benign. I would certainly not call them "criticisms". I sent them to Mark later than I would have liked to, and even indicated that it was possible that they may arrive after he completed his final report. I thought the comments may still be useful for other reports that he may develop in the future, and that it was better to send late than never. I simply fail to see the connection between McCammon's reasonable request for a due date for Dr. Herrmann's technical report and Marks angry response on timing of my March comment letter.

B. I have searched, and have not been able to locate, a complete copy of the article on farmed salmon production projections that Herrmann mentions in his letter. During our phone conference last fall, I even told him which magazine it came from. Since our phone conference between the researchers and the technical review team was voluntarily recorded, **I actually have my citation of the magazine that was given to Dr. Herrmann on audio tape.** Following the conference call, **I sent FRED Division technical comments to Ginny Fay that specifically included a section in my comments on the issue of the Northern Aquaculture Magazine that contained the article.** My 6 page comment memo, dated November 17, 1992 is attached and the citation is on page 2, comment #3. Ginny Fay told ADF&G that she sent all comment memos directly to the researchers. If this is the case, perhaps Herrmann never bothered to read any of the ADF&G comments. If it was so critical to his finalizing of the report, why couldn't he have just called the library? Mark never indicated to me that it was somehow holding up his re-estimation of the models, and I never received so much as a Fax telling me that he urgently needed it. Here is the title page (all I have been able to locate) of the infamous article.

Alaska State Legislature

Representative Carl E. Moses



CHAIRMAN
HOUSE RULES COMMITTEE

CHAIRMAN
HOUSE SPECIAL FISHERIES COMMITTEE

MEMBER
FINANCE SUBCOMMITTEES
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February 25, 1993

John R. Boyce, Ph.D.
Mark Herrmann, Ph.D.
Center for Fisheries Economics
Department of Economics
University of Alaska Fairbanks
Fairbanks, AK 99775

Dear Drs. Boyce and Herrmann:

I would first of all like to thank you both for your efforts in assisting the Legislature with its review of the state's salmon enhancement program. Those of us directly involved in the project, realize --and appreciate-- how much work it has entailed.

I will be acting as the contact for the Legislature to receive the final work products covered under the Reimbursable Services Agreement on A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. While the Final Report for the overall benefit-cost study has been distributed, the RSA calls for some additional work products that have not been received in final form by the Legislature. Without them, our accounting division will not authorize final payment. The purpose of this transmittal is to describe the missing work products and due dates as I understand them, and discuss and reach agreement with you on a description and final due date for each one. Some of the work products which are inappropriate to keep in the Legislative archives may be housed with the Commercial Fisheries Entry Commission.

The following list describes the work products and due dates for various input and output data files, computer code, documentation and technical reports that we have not received. The list is as complete as possible, but there may be some additional information requests that we cannot anticipate at this time. The summary tables and technical reports should be mailed and not sent by fax.

Summary of work products requested by the Alaska State Legislature.

1. Overall CBA Model: While the RSA calls for the overall CBA software in SAS, ADF&G has received the copy in GAUSS and will be reviewing it over the next 2 weeks to determine if it is sufficient in lieu of the more familiar software. We understand that you encountered some difficulty in reprogramming the GAUSS code into SAS. By the second

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COLD BAY - DUTCH HARBOR - EGEK - ERWOK - FALSE PASS - IVANOF BAY - KING COVE - KING SALMON - KOLIGANEK - LEVELOCK - NAKNEK
NELSON LAGOON - NEW STUYAHOK - NIKOLSKI - PEDRO BAY - PERRYVILLE - PILOT POINT - PORT HEIDEN - PORT MOLLER - SAND POINT
SHEPHERD HARBOR - SOUTH NAKNEK - ST. GEORGE ISLAND - ST. PAUL ISLAND - UGASHIK - UNALASKA - UNGA

week of March, they will inform us if it is usable. In the interim, we request that you assist ADF&G with answering any questions about the GAUSS version of the model.

2. Overall CBA Model: We understand that there are comment statements and some operating instructions in the recent CBA simulation model that you sent to Mr. Hartman. If ADF&G can operate the model, and edit the files without a hands-on tutorial, then the existing software and documentation will be sufficient. If they cannot unravel the documentation sufficiently, we request a half or full day hands-on tutorial for the overall CBA simulation model in Juneau or Fairbanks. ADF&G would consider paying travel costs for a tutorial, and we would not ask that any travel costs be born by the researchers. If for some reason, the GAUSS version turns out to be totally unworkable, we will reserve the right to ask for a SAS version at some reasonable date set early in March 1993.

- * 3. Overall CBA Model: Input files and tables for the CBA simulations in the 17 cases.

•Include a hardcopy of annual tables for hatchery production (harvest) in numbers of fish and pounds by species and region used in the simulations. We do not want just the aggregated wild and enhanced catch. The only production input data we have seen so far are a fax of aggregate production numbers in the output tables for the Thirty year Present Values by Region, by Cases sent to Ginny Fay on November 2, 1992.

•Hardcopy of all other annual input variables such as production costs for state and PNP hatcheries for each year not listed in the CBA report.

- * 4. Overall CBA Model: Output files for the CBA simulations in the 17 cases.

•Include a readable hardcopy of the final version of the Thirty year Present Values by Region, by Case sent to Ginny Fay on November 2, 1992. This set of tables summarized gross benefits, gross costs, and net benefits. We believe that the earlier version was supplanted by a later simulation. If this is not the case, we still need a clean version to be mailed.

- * 5. Demand Model: Detailed technical report for the demand model. Mark Herrmann stated in his memo of December 16, 1992 to Ginny Fay that the technical report for the demand model would be completed by Mid-February. We will assume that it can be sent by March 1, 1993, but the Legislature's primary interest is in receiving a completed and clear technical report, within the next month. Please let me know if the completion date of March 1, 1993 is workable.

- * 6. Fishing Cost Model: Detailed final technical report for the model. It is our understanding that the author was going to make further editorial changes in this report and also provide us with a final by mid-February. Please let me know if the completion date of March 1, 1993 is workable.

- * 7. Demand Model: We would like to have a hardcopy of the file that you used to convert numbers of wild and enhanced fish in non-intensely modeled sites to pounds. We want to see the mean weights used for these and know where they came from.

- * 8. Demand Model: A cleaner copy of the response memo from Mark Herrmann to Ginny Fay of December 6, 1992. The faxed copy is unreadable.

9. Demand Model: The Legislature should have access to the GAUSS code and SAS log file for the estimation procedures used in the demand model. We may not ultimately need to ask you for the estimation code if the Final Technical Report provides sufficient

information on the estimation procedures. Any estimation code for models and functional forms that Mark tested, and did not work, would not be requested. At this time, we want to reserve our rights to the final model estimation procedures only if needed. I would be happy to discuss this further.

10. Demand Model: Mark Herrmann's memo of December 6, 1992 states that he will be working on a final simulation model over the next six months. We assume that it would be completed in May 1993. The memo also says that he plans to provide us with a more user friendly version of the simulation model at that time. Since the existing software that you sent to Jeff Hartman does not have sufficient comment statements or documentation for ADF&G SAS users to easily duplicate, we would like to accept your offer for the more thoroughly documented version that you indicate will be available in May. Would this be available by May 31 1993?

11. Demand Model: ADF&G will be reviewing the SAS code for the simulation models and trying to get them to run in the first 2 weeks of March. We request that you assist them by answering any questions that are generated during that review. Prior to the review, ADF&G would like to obtain a copy of the SAS log printout from one simulation of the model.

12. Demand Model: If you are going to be rewriting the simulation software to be more user friendly anyway, it would help if there were clearer comment statements in the SAS code for the simulation model. The comments are mostly difficult-to-read handwritten notes.

13. Demand Model: Please give a rough estimate of the amount of time required to run one case with the demand model simulation software, and note the speed of the computer that you are using.

14. Please supply the remaining files for data required to run remaining 11 simulations. The Base case was previously sent. It would be helpful to receive this by mid-March.

15. Demand Model: In lieu of a detailed users' instructions for the SAS simulation model, we request a one day hands-on tutorial for the Demand model in Fairbanks or Juneau. ADF&G would like to arrange for this following the completion of the more user friendly version in May (the completion date that Mark Herrmann noted in his December 6, 1992 memo).

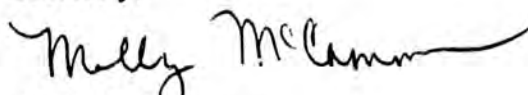
16. Fishing Cost Model: Please send an electronic file of the GAUSS code used to edit the fish ticket file into daily observations for the final regressions used in the fishing cost study. This does not need to have comment statements. This should be sent by March 31, 1993.

17. Fishing Cost Model: Electronic copies of aggregated and final data sets for the cost model need to be sent to CFEC. ADF&G has expressed interest in paying for reasonable file transfer, storage and shipping costs for this data. Please contact me for an estimate.

Finally, my intent here is to make sure that all of the requirements of the RSA funded by the Alaska State Legislature are completed. Our requests for the final work products should, however, be reasonable for the researchers to respond to. I need to be contacted at 465-6848 by March 1, 1993 to discuss any questions you may have about the final work products or associated due dates.

The House Special Committee on Fisheries, chaired by Representative Carl Moses, intend to hold hearings on your report in early April. However, we would also like to see further technical and peer reviews completed before that time, and these will probably depend on how soon we can get all of the above products. I would appreciate your assistance with this. Please let me know as soon as possible if you foresee any problems with this. Again, thank you for all your efforts in this project.

Sincerely,

A handwritten signature in cursive script that reads "Molly McCammon". The signature is fluid and extends to the right.

Molly McCammon

cc: Dianne Bischak
Joshua Greenberg
Keith Criddle
Jeff Koenings
Kurt Schelle

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

TO: Ginny Fay
Legislative Staff
Committee on International
and Domestic Salmon Fisheries

DATE: November 17, 1992

FILE NO:

THRU:

TELEPHONE NO: 465

FROM: Jeff Hartman *JH*
Economist
Division of FRED
Department of Fish and Game

SUBJECT: Comments on CBA
of Enhancement

I have constructed some preliminary comments on the 5 manuscripts that you have provided relating to the CBA of fishery enhancement in Alaska. I think it will take some time to sort out what the studies mean, but hopefully this will assist you in your interactions with the contractors.

General Comments on the work products.

1. I feel that it is essential that UAF be required to supply the software for the models in SAS, and appropriate documentation indicated in the RFP.

My experiences with simulation models are that it is difficult fully understand what they mean until you operate the software for a while. For this reason, UAF needs to complete the requirements of the RFP and produce a workable simulation software for us to experiment further with. From my conversations with John Boyce, who indicated that individual simulations of the entire combined model (SAS and Gauss) can be run in a matter of a few hours, I believe that the models are not too complicated for you or I to learn how to operate. I am not sure that the "users" version of the simulation model needs to have all of the regression statistics. I believe that I can learn more about the models with a Monte-carlo approach to sensitive testing anyway.

2. All of the RFP's that I was asked to review and comment on, made it clear that final simulation models must be in SAS. John Boyce explained to me in the last month or two that he has not rewritten the equations for the cost model from GAUSS into SAS. Certain criteria in the RFP were relaxed during the model development, so that the contractors could complete the work within the scheduled period. I do not think that John was released from the obligation to create combined model software as promised.

NAPLEX -- arrival price of h-v salmon

NAME

NAPUSA -- Norway price of Atlantic salmon exported to U.S.

NAPNOR -- Norway price of Atlantic salmon exported to NEC

NCPT -- NEC cpi

NY -- NEC income

JY1 -- Japan income

UCPI2 -- U.S. cpi

UY2 -- U.S. income

JPOP -- Japan pop

JCW12 -- Japan cpi

UPCV -- U.S. pop

KPOP -- NEC. pop

FOURCU -- Exchange rate = kroner/ecu

FOURDA -- Exchange rate = ecu/dollar

JAPUSA -- Exchange rate = yen/dollar

FOURDA -- Exchange rate = kroner/dollar

FP42P -- Japanese tuna price

FP42P -- Japanese squid price

JAPDISC -- Japanese discount rate

STAX -- NEC tariff on fresh/frozen salmon

Next are indicator variables

DQ1 DQ DQ3 D4 G DQPT90 DEARS1 JTAX UTAX D66 D89 D87 D4T
DISMSE D8.

Once SIM1.SAS is run you will get output that should be identical to SIM1.LST. The hard copy of SIM1.LST, that I sent you, is just a small portion of the one you will get. The only valid statistics are the output prices, quantities, and revenues for the five species modeled for the five species. The goodness of fit stats are invalid because this is the forecasting program, not the historical simulation program. I have written on the hard copy of the output how to read the output.

To prepare the output to run in John's Gues program, he will need to tell you how it is to be formatted. I gave him files that looked like X. You will eventually need to duplicate this entire file to be sure that you have the final results stored in John's program.

The tricky thing here is to pick the prices from the file to be read into GAMES. There are five price series in the file. The first two are for the worst case scenarios only. They do not reflect the "I case". (The ones that are 0.25 strength between chum and pink salmon.) To get cross-price substitution effects between pink and chum do the following.

Example.

If you run scenario 5 -- eliminate peak program -- then you must not use the predicted chain prices for this run. What you need to do is to take the predicted chain prices from SIMI.SAS, subtract off the predicted chain prices from SIMI.SAS, multiply them by 0.25 then add them back onto the prices from SIMI.SAS. In this way you will get the prices found in JOHN1.LST.

I again apologize for the program being so hard to run but I was pushing the deadline for the grant to be finished and the last thing I was worrying about was making the program easy to run. As I state in the letter, I believe that I will put continued resources into the program's fine tuning of the predictive capabilities before I worry about making it more user friendly.

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

TO: Ginny Fay
Legislative Staff
Committee on International
and Domestic Salmon Fisheries

DATE: November 17, 1992

FILE NO:

THRU:

TELEPHONE NO: 465-4160

FROM: Jeff Hartman 
Economist
Division of FRED
Department of Fish and Game

SUBJECT: Comments on CBA
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3. Some of the requirements in the original RFP that the contractors were released from are included the following, these should be noted somewhere in the report.

- Collie did not have to carry out initial simulations in SAS.
- Collie did not have to write a final report, only a summary.
- Boyce did not have to carry out the simulations for the policy analysis in SAS, but did have to make final model in sas.
- The UAF team was told that they could truncate the change in annual net present value at 15 years instead of estimating the model using the production data provided from 16 years to 30 years as called for in the RFP.

Comments on "A Benefit-Cost Analysis of the Alaska Salmon Hatchery Program"

1. There is no complete summary of all of the values that are used in the exogenous variables in the combined simulations. We need to see annual variable tables for (1) production of enhanced and wild harvests, (2) production of other north America wild and ranched harvests, (3) production of farmed salmon by country and species, (4) income, (5) exchange rates, (6) population, and (7) cost of production. We need to these numbers somewhere in an appendix to be sure that this part of the analysis is consistent with the agency data provided, and so we can understand how the changing of the input variables affects the output prices, change in revenue, change in fishing cost and change in NPV.

2. The 30 year NPV of the entire Alaska salmon is quite large compared with some of the changes in NPV that are simulated in the cases. For example the total NPV for the current case (\$2,329.91 million) is a 10.4% decrease over the NPV for the elimination of the pink salmon program of (\$2,602.34 million). Contrasting all cases, this is the second largest change in the value of the hatchery program revealed in any of the simulations. The largest one, elimination of the entire hatchery program was deemed to be unreliable by the authors. Giving that total NPV is only changing by 10%, how dependable are the results for policy analysis?

Article →
3. I assume that the trajectory (used in the simulations) for farmed salmon production from 1993 to 2022 uses a starting point from 1991, this would be a production level of 314,300 tones. The 1992 survey of operators published in Northern Aquaculture Sept/Oct 1992, projects that the farmed salmon production is projected to fall by 1/4 of this amount to 266,000 tones by 1993. The authors also describe the existence of some constraints to future Chilean production. Are these differences in production significant enough to affect the outcome of the projected net present values?

4. The assumptions for the production related variables came from several sources, including (1) the original RFP (for example I believe the RFP explained that some simulations would be made with the assumption of a 5, 10, and 20 year mean background harvests of wild fish), (2) ADF&G (such as estimates of change in harvests of the production from state owned hatcheries), (3) Jeremy Collie, (4) PNP operators, (5) Mark Herrmann (from interviews with other farmed salmon producers and agency people familiar with the wild and ranched production of other countries), and (6) the project manager for this study (for example from September meeting with contractors where production numbers of non-intensively models wild stock catches were set at the 10 year mean). I do not think the current document makes it clear where each of the sets of production assumptions originated from. These will be important issue for the readers of this study, and the origin of the assumptions should be accurate and occur in 1 location in the report.

5. Jeremy Collie generated production harvest forecasts for the "planned" enhancement case. Operators of the PNP and State Hatcheries also generated production estimates for this case and the other cases. Who's numbers were used for the planned case? Are there any cases that the operators numbers were used. I expressed concern that the operators numbers should be used in some of these cases in the September 1992 meeting in Fairbanks. This was the first time that I understood that operator projections would not be used in any cases.

6. The sensitivity testing for different levels of probable wild catches was dropped out of the RFP when the contractors revealed that they did not have sufficient time to meet the deadline. How much of an effect on the NPV occurs if the means harvests for wild fish are used that do not fall within the highest recorded harvests in the history of the salmon fishery.

7. Some simplifying assumptions were made on enhancement program costs because it was not possible to survey all possible cost combinations. Costs of decreasing productions were assumed to be equal to increment from increasing production by 15%

8. The cost of total 15% increase in production costs for the case that increases across all species is assumed to be sum of 15% increase in production costs by species.

9. There are several sources of cost of production data used in this study, the origin of each major piece should be noted. Some came from FRED, Commfish, Operators etc.

10. There is no rationale given for using the real interest rates specified in the text. I agree that 4% and 7% are reasonable alternatives, but there should be some explanation of why these were used instead of say 3% and 6%.

11. Pg 7. footnote. The text and footnote say that the ending revenues at year 15 are too high so the authors estimated a mean from year 10 to 15. Why the mean used here? I never remember any discussion along these lines. Even if revenues were higher at the end of the 15 year period, that is what happens with some enhancement programs in the broodstock development process. Which way does this bias results? The footnote says that the rankings from highest to lowest NPV may not be affected with this assumption but I believe that the total NPV may be. If revenues are expressed as a mean shouldn't costs also be? This is a fairly significant departure from what I thought the contractors had initially proposed to use for projecting year 16 to 30 NPV in our September meeting, and from what seems to make sense based on my understanding of the operators production plans.

12. There are a number of syntax errors in the manuscript that make it difficult to understand and detracts from the overall study. These should be corrected.

13. There are several misstatements about the statewide enhancement program in the recommendation section, particularly with respect to funding sources. The largest sources of funding for the statewide enhancement program is now financed by cost recovery and enhancement taxes.

14. Pg. 15 "The cost per fish of the hatchery program" In this section some production cost generalizations are made from data accumulated across 30 years of production. The text refers to the current case in reference to an event that occurred in a previous year. The comparisons being made do not involve equivalent years or assumptions about costs of production. In 1991, pink salmon were produced by hatcheries at ~~some~~ production cost incurred generally in 1990. We don't know what those production costs were, but you cite the projections made by operators as though they are the

same. Secondly, the operators of the enhancement projects, project a different total harvest for pink salmon than was finally generated by Jeremy Collie, so it is not correct to imply that these were the average cost projections of the operators. Finally, the 1991 harvest year is one event, and generally perceived to be an atypical event. \$0.12/lb is clearly a low price, but it is difficult to say that it represents the minimum price fishers are willing to accept at the quantity produced. I think the comparisons made here are instructive to the audience intended, but they could use some qualifiers.

15. Pg. 7 The footnote indicates that revenues for years 16 to 30 were determined by fixing revenues at the 10 to 15 year mean. For computing cost per pound, did the authors also compute pounds harvested in this manner for year 16 to year 30?

16. Pg. 16 The text says "To get a measure of the cost of a 15% decrease, we took 15% of the reported costs of a 100% decrease." This is different than the instructions given to the contractors by the project manager in the September meeting at UAF. The decrease was to be equivalent to the increment used for the 15% increase case.

17. I generally think there needs to be further clarification of what was included in the operators survey, at least by including a copy of the survey instruments in the appendix.

18. Pg 18. An econometric model that explained the substitution effects between salmon species at the landed level was one of the primary goals of the study. Why were the analysts unable to achieve this objective?

Comments on demand models

1. The simulations are made with numerous assumptions that are not fully explained in the text. This makes it very hard to determine what the simulations mean without inside knowledge of what the UAF team assumed.

Some examples of assumptions that should be documented in the study include:

Assumption a. Fish (both cost recovery and capture fishery) will be distributed into same product forms as they were traditionally.

Assumption b. Enhancement fish harvested in commercial fisheries are assumed to have the same mean weight as the mean weight from all fish harvested in a region.

Assumption c. The two low priced species are assumed to be substitutes as are high priced species, possibly leading to higher substitution effects than may be warranted.

2. Question pg 24 and 25. Elasticities for the block one equations appear to approach -2.0 or even exceed this value. Why are the change in total revenues reflecting elasticities approaching -1.0 or even less unitary elasticity in the simulations? The manuscript says that these elasticities should be referenced with caution, but does not explain why the simulation results are so different.

3. It is difficult to determine where the revenue loss is being distributed between each species in the

simulations. I tried to generate an own price elasticity from the revenue tables in the simulations and could not do it because there are no tables of annual exvessel prices generated for the cases. It would be helpful to see a table of the point prices estimated for each year of the simulations by species so that we can determine which species are bearing the revenue loss when another species is enhanced. John Boyce included such a table for the salmon demand studies for the state of Alaska in 1990 and it was very helpful.

4. Pg 148. There are certain conclusions drawn on the possible efficiency of a specific alternative investment of marketing and experimentation with different product forms. We don't know if the efforts to expand world demand would work from the UAF CBA studies conducted here. If they were cost efficient than they may be a good investment. Lots of alternative uses of the funds.

5. The documentation should have a clear discussion of how much of the explanatory power is lost between block 1 and block 2 estimates. At present is very difficult to determine how much precision is lost when dependent variable is the price of an individual species (block 2) instead of combined groups (block 1).

6. The prices used in the block 1 estimations are aggregated. They are really not individual price observations in block one, but the average revenue per pound. How do the aggregation of these prices affect the analysis?

7. Question: pg 3. It states that "Factors affecting wholesale level demand and supply will be included in the reduced form exvessel price equations." What does this statement mean?

Comments on cost models

I received a final manuscript for John Boyce's work on 11-19-92, so I have not had time to even provide any more than a cursory review of his results yet.

1. The manuscripts for the cost model and over all CBA describe the new and unique approach for estimation of fishing costs. The testing of this technique is called for in the RFP with the proviso that the contractors should use their best judgement in recommending an approach for estimation of fishing opportunity costs for the simulation model. It is not clear from the manuscript that the contractor believes that these functions to be the best ones for the task at hand, or that the costs are reasonable for applying to the enhancement program. I believe that this needs to be clarified further, since these catching costs have a significant effect on the NPV of sockeye, coho, king, and red salmon projects.

2. The fishing cost model is modified from techniques usually applied to non-market valuation (Cameron applied similar methods to estimation of the value of recreational fishing in Canada). The techniques indirectly rather than directly compute fishing costs, and there are pros and cons of each approach. It is customary, however, to verify highly novel non-market valuation techniques with information from fisher's themselves. For example, it would be nice to know if participants in the seine fleet in Lower Cook Inlet believe that the additional costs of catching enhanced sockeye salmon occur at the implied output prices estimated in the models? I contacted some Lower Cook Inlet Seine fishers and asked what percent of their total revenues would marginal fishing costs be if they were exposed to slightly larger or smaller catches 1990. I was told that the additional costs of catching an increase in abundance led to much lower costs than the 59% indicated in the study. Both fishers told me that the costs were much closer to 40% to 45% of gross earnings, and these consisted mostly of the crew share and enhancement taxes.

3. The enhancement tax is a transfer. Shouldn't change in this be subtracted out of the fisher's costs for each of the regions?
4. Did the PWS stat area include Copper River? This is a typical alternative for fishing in the pink fishery for gillnetters.
5. 1990, the year used to develop the cost models was the first of three years of low revenues for most of the state's enhanced fisheries. Could the use of a year with lower than typical revenues bias the computation of producer surplus in either direction?
6. The RFP specifically asks for a long run model for estimation of fishing costs. I do not see a discussion of whether the authors believe that they have achieved this in any documentation.

Comments on biological population model

I do not have a current manuscript for Jeremy Collies work, so I cannot comment on this one yet.

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

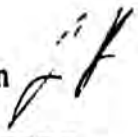
TO: Mark Herrmann
Assistant Professor
Department of Economics
University of Alaska, Fairbanks
Fairbanks, AK 99775

DATE: February 28, 1993

FILE NO:

TELEPHONE NO: 465-4160

SUBJECT: A Few Comments on
the Salmon Demand Model

FROM: Jeff Hartman 
Economist
Division of FRED
Department of Fish and Game

Comments on Draft Technical Report.

Following our earlier discussions on the cost-benefit analysis you mentioned that you were interested in getting my review comments. I have not seen a final version of the International Marketing Model for Alaskan Salmon, so I hope my few comments will still be of some use to you. I believe that most of these comments have not been raised in any past reviews.

1. Pg 3 Quote from the text: "Factors affecting wholesale level demand and supply will be included in the reduced form equations."

Question: I thought that efforts to derive exvessel prices from wholesale prices were unsuccessful in this study, and that landed prices were derived from export quantities and prices?

2. Is "private expenditure" (pg 32) the same variable as "private consumption expenditure" for EEC (pg 112)? This is a statistic that I am not familiar with. Others reading the technical report, may be curious about what it is also. If there is more of an explanation in the text I on this I apologise for missing it.

3. Page 113. Quote from text: "The 10-year average harvest was agreed upon by Ginny Fay of Senator Cotten's office and Jeff Hartman of FRED Division and communicated to the principal

investigators in a September meeting at Fairbanks, Alaska." I agree that the October meeting produced clear direction from the project manager to contractors regarding which point estimate of production she wanted to use. However, as you will recall, I did voice strong objections to using 1 instead of three production points, and also stated my misgivings over which years should be used in the single point aggregation. It would be more accurate to say that: The project manager decided which point estimate to go with when it was revealed that there would not be sufficient time to run all 17 cases with the bracketed wild production for non-intensively modeled sites cited in the RSA. I realize, that the time constraint was not imposed by the researchers.

4. Page 113. Quote from text: "The future hatchery harvests for the other Alaska regions and species were estimated by the hatchery operators in a survey conducted by the FRED Division of ADF&G."

Comment: This is not quite correct. The survey was requested by the legislature. The state hatchery survey was carried out by ADF&G at the request and under the oversight of Ms. Ginny Fay. The PNP survey was administered by the Legislative Research Agency under direction of Ms. Ginny Fay, special assistant to Senator Richard Eliason.

5. A table of the mean weights used for computing production of enhanced fish from the non-intensively modeled sites would be helpful to the reader. Also, a table of the production numbers for enhanced non-intensive and intensive sites by year, that you used, would be useful for people trying to follow your discussion on the findings of each case studies.

6. Page 117. The text describes the interval testing that was applied to some of the exogenous variables. Graphs of the predicted output prices are provided, but there is not any discussion in this section of how these tests varied price response. It is the difference in own and cross price response between the current case (1) and the other 5 cases tested, that would tell us if the price response is large or small when the sensitivity testing was applied. I would like to hear in the author's words, whether these levels of variation in price are going to significantly change the outcome of the change in revenue from enhancement or not?

7. Page 148. Quote from the text: "Therefore, it may be advisable to increase efforts aimed at increasing demand for salmon, particularly pink salmon,..... This investment may provide greater returns to the salmon industry than investment in increasing salmon hatchery production."

Comment: The reader can see most of your econometric evidence, and quantitative analysis behind your conclusions about salmon enhancement in this manuscript. They cannot observe any equally rigorous study results presented about your advice to "increase marketing and promotion, product development, market expansion and development of new markets". I too, hope that these sorts of efforts would shift the demand curve outward into a more elastic region. Since of these types of marketing efforts have been underway for some time, some might question if there is much current evidence for certain types of marketing efforts to shift the demand curve where we would like it to be.

If you want this study to be remembered for its quantitative accomplishments, I think the framing of your advice statements above actually detracts from your main message. Perhaps if you were

to say that "If this investment were to succeed in shifting D1 outward sufficiently, than it may produce positive net benefits for Alaska." Or substitute "it may be worth further investigations of", instead of "It may be advisable".

8. Though not required in the RSA, some discussion of the next suggested steps in research on salmon demand would be helpful.

Software and documentation:

1. I am starting to review the CBA simulation model that John Boyce provided. After the CBA model is working we plan to start on the simulation software that you sent for the Demand model. A couple of our SAS experts are also interested in it. It sounds as though you plan to make changes in the simulation models and make it more user freindly in the next few months. After we review the current simulation software, we could provide some input on comment statements and documentation if it would aid in your subsequent software documentation.

2. Output files from simulation model.

I have attached a copy of one of the output files that you sent me. I have noted some variable names that may have typo's in them.

3. Some of the proc statements used in your simulation code are not covered in my Version of SAS/ETS User's Guide. Can you tell me which version of the SAS User's Guide these came from, and which PC version of SAS you are using?



UNIVERSITY OF ALASKA FAIRBANKS

School of Management

Fairbanks, Alaska 99775-1070

March 31, 1993

Molly McCammon
Alaska State Legislature
Capitol Building, Room 204
Juneau, Alaska 99801-1182

Dear Molly

I apologize for the delay in answering your request to address the last requirement of the salmon demand portion of the state salmon study. I am happy that we have agreed that other areas of the demand portion have been fulfilled and that the final payment to UAF will not be held up. This news has certainly lessened the pressure on me.

I am going to suggest a couple of options to satisfy the programming part of the grant. I'll let you choose the most desirable then I will write it up more formally before I start to work on it. I was interested to read that Koenings was quoted in the paper as saying of our model that "We don't have any confidence at this particular time in what's coming out of that work model". I take it from this comment, and others, that the FRED division is no longer interested in using the model. This is probably good news since we are not speaking to each other and I now am free to document the use of the model so that the state can use it for verification. As I said before, this model was not intended to be used for any other project than this and was not designed to be effective for a period longer than the current time period, i.e., if the model were to be used in two years it would be much better to re-estimate the model with two additional years of data. If we had been asked to build a model that would have been more flexible to answer many different scenarios we could have done so. But this was not the purpose of the grant.

Therefore, I propose the following three options. Let me know if either one is acceptable or a third option would be preferable. Once you reveal your preference I will more formally write out a detailed plan.

Option 1 - Iterative option.

We could do this as an iterative procedure. This would involve someone from the state taking bits of the tremendously large program, as I send it (with documentation), and verifying the results of our study. This process would be complete once the entire program was transferred. It would probably take 8 or 9 iterations. The advantage would be that we would be sure each part of the model was running before the next one arrived. The disadvantage would be, that under this scenario, I would not take the time to reprogram the mode to become more user friendly and there would be more steps taken to achieve the final objective. I would be ready to send the first installment sometime in June. I anticipate approximately three months to finish the transfer.

Option 2 - User Friendly Option

I would make the program easier to use by spending more time on documentation and combining as many of the sub-programs as possible. It would still not be possible to combine all sub-programs. For this effort I would need Josh Greenberg's help since he is a much better SAS programmer than I am. We would be able to start this project after school is out, sometime in June. I anticipate about four months to rewrite the programs and to document it.

Option 3 - The Safer Option

Since the model is extremely complicated and since I am the only one who I trust to run it without making runs which are inaccurate (or dangerous in their use) I could make a reasonable amount of runs that were specified by the state. In this case I would send all the programs to you without documentation. I would instruct Josh on how to run the programs (in case anything happened to me). Then we could agree on a reasonable number of runs that I would make that the state may desire. Again, I do not believe the model will be useful much past a year or so from now so I am not sure what different scenarios may be required. The advantage here is that I may be able to fix the model if (when!) it crashes and can stop any possible troubles in the intermediate steps. Since there does not seem to be any great need by anyone at the moment to continue using the model this might be the quickest and easiest solution for all involved.

In any case, does the state have the capacity to read 128 meg optical hard disks? This would be a much easier way to transfer the sizable programs than on floppies. If not, we can do it on floppies, probably enhanced by a common crunching program.

Thanks for your continued work on the project. Sorry that there have been so many miscommunications.

Cheers,



Mark Herrmann

Molly
WALTER J. HICKEL, GOVERNOR

APR 13 1993

DEPARTMENT OF FISH AND GAME

**COMMERCIAL FISHERIES MANAGEMENT
AND DEVELOPMENT DIVISION**

P.O. BOX 25526
JUNEAU, ALASKA 99802-5526
PHONE: (907) 465-4160
FAX: (907) 465-4168
CJM

April 8, 1993

Mr. Chris Mitchell
Executive Director
Alaska Fisheries Development Foundation
508 West 2nd Avenue, Suite 212
Anchorage, AK 99501

Dear Mr. Mitchell:

The Alaska State Legislature has encouraged the Department of Fish and Game select a contractor to carry out a technical review of a recently completed economic study of the statewide salmon enhancement program. The study and supporting technical documents for *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program* was produced for the Senate Special Committee on Domestic and International Fisheries in 1993 by the University of Alaska-Fairbanks, School of Management.

To carry out this technical review, the Commercial Fisheries Management and Development Division requests your assistance in finalizing contract language for the technical review and also participating in the contractor-selection process. We are interested in developing contract language that would result in a balanced, high-quality technical review of these studies. Your background in contracts related to Alaska's fisheries would provide helpful input for formulating the final documents.

I have enclosed a draft Authority to Seek Professional Services which details the questions that would be posed to the contractor as well as the scope of work to be covered in the technical review. It would be greatly appreciated if you could provide comments to me on the framing of the questions and scope of the work by April 15.

In addition, we are looking for economists to include on the list of potential technical reviewers. These economists must have strong skills in econometrics and fisheries economics. They should be familiar with the international markets and supply and price data for salmon. In particular, they need to have an understanding of the Bayesian bootstrapped-version of two-stage least squares used in these models. This is one of the major areas that the original technical review team had difficulty understanding.

Mr. Chris Mitchell

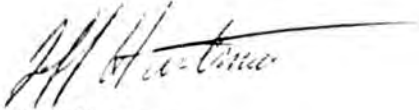
-2-

April 8, 1993

At this time, I am only aware of two economists that have these qualifications. They are James Wilen of the University of California-Davis and Ira Strand of the University of Maryland. If you are aware of additional economists with these qualifications, please contact me by April 12.

Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jeff Hartman", with a long horizontal flourish extending to the right.

Jeff Hartman
Economist

Enclosure

cc: Johnny Holland
Jeff Koenings
✓ Molly McCammon

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

TO: Dave Massey, Loan Officer
Division of Investments
Department of Commerce and Economic
Development

DATE: April 7, 1993

FILE NO:

TELEPHONE NO: 465-6155

SUBJECT: Request for Review
of Professional Services
Agreement

FROM: Jeff Hartman 
Economist
Commercial Fisheries Management
and Development Division

The Alaska State Legislature has encouraged the Department of Fish and Game select a contractor to carry out a technical review of a recently completed economic study of the statewide salmon enhancement program. The study and supporting technical documents for *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program* was produced for the Senate Special Committee on Domestic and International Fisheries in 1993 by the University of Alaska-Fairbanks, School of Management.

To carry out this technical review, the Commercial Fisheries Management and Development Division requests your assistance in finalizing contract language for the technical review and also participating in the contractor-selection process. We are interested in developing contract language that would result in a balanced, high-quality technical review of these studies. Your background in the private nonprofit enhancement program would provide helpful input for formulating the final documents.

I have attached a draft Authority to Seek Professional Services which details the questions that would be posed to the contractor as well as the scope of work to be covered in the technical review. It would be greatly appreciated if you could provide comments to me on the framing of the questions and scope of the work by April 15.

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Thank you for your assistance.

Attachment

cc: Johnny Holland

Jeff Koenings

Molly McCammon

MEMORANDUM

STATE OF ALASKA
Department of Fish and Game

TO: Kurt Schelle
Research/Planning Project Leader
Commercial Fisheries Entry Commission

DATE: April 7, 1993

FILE NO:

THRU:

TELEPHONE NO: 465-6155

SUBJECT: Request for Review
of Professional Services
Agreement

FROM: Jeff Hartman 
Economist
Commercial Fisheries Management
and Development Division

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To carry out this technical review, the Commercial Fisheries Management and Development Division requests your assistance in finalizing contract language for the technical review and also participating in the contractor-selection process. We are interested in developing contract language that would result in a balanced, high-quality technical review of these studies. Your background in fisheries and this economic study would provide helpful input for formulating the final documents.

I have attached a draft Authority to Seek Professional Services which details the questions that would be posed to the contractor as well as the scope of the work to be covered in the technical review. It would be greatly appreciated if you could provide comments to me on the framing of the questions and scope of the work by April 15.

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Thank you for your assistance.

Attachment

cc: Johnny Holland

Jeff Koenig

Molly McCammon

FDE 145-90: EXECUTE RSA

W 0694213 S 0012

RSA NUMBER 3127107 TRANS CODE MINOR 90
DOCUMENT NUMBER A06942180012
SOURCE RD CODE 11966 ADDITIONAL AUTH RD 31070
EXECUTE AMOUNT 21737.91
DESCRIPTION LONG 21737.91 2/93 BILL LEGISLATIVE ANALYSIS_
OF STATEWIDE SALMON ENHANCEMENT PROGRAM_
AR 42845

FISCAL PERIOD CODE C
FEDERAL FISCAL YEAR -- DENOMINATOR ----

FIN LINE	AMOUNT	NMR
1	---	---
2	---	---
3	---	---
4	---	---

PF1=QUIT 3=SUBMIT 4=BATCH ERRS 5=BASE 6=FIN

12=DELETE

Post-It™ brand fax transmittal memo 7671		# of pages >	
To	Molly	From	Karla
Co.		Co.	
Dept.		Phone #	6626
Fax #	3445	Fax #	X3234

Amendment

Scope of services?

\$ amount?

Completion date?

ASAB1000-01 RRN: 0033672
RSN: 02669 CPD: 03/06/93

DISTRB RD: 11963 D03

STATE OF ALASKA
STATEWIDE ACCOUNTING SYSTEM
1993 RECENT ACTIVITY AUDIT TRAIL REPORT

PAGE:
DATE: 03/07/93

MAR-24-93 MED 11:41

LAA EXEC DIRECTORS OFFIC

FAX NO. 4653232

P.02

DOCUMENT	VND/EMP/DSTRB DESC	TRANS	WRNT	NUM	SY	CC	PGM	LC	ACCT	DATE	ACTUALS	ENCUMBRANCES	BUDGET	
A06858130018	UAF91309 UNIVERSITY OF	310-10	23412073	92	11001014			11001014	73270	02/13	21737.91	22350.00-	0	
XXXX TOTALS FOR AT EX												21737.91	22350.00-	0
XXX TOTALS FOR CC 11001014												21737.91	22350.00-	0
XX TOTALS FOR LC 11001014												21737.91	22350.00-	0
* TOTALS FOR AR 42845-93												21737.91	22350.00-	0

University of Alaska Fairbanks
Grant and Contract Services
109 Administrative Services Center
Fairbanks AK 99775-0840
Telephone 474-6075, FAX 474-5508

February 5, 1993

Jenifer Childress
Alaska Dept. of Fish and Game
PO Box 25526
Juneau AK 99801-5526

Project Title Legislative Analysis of Statewide Salmon Enhancement Program

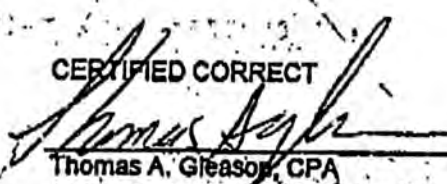
Request for second 50% payment per terms and mechanics of reimbursement for
RS1121091/EN1123510. RSA amount: \$44,700.00.

FINAL PAYMENT REQUEST

	<u>Current Expenditures</u>	<u>Cumulative Expenditures</u>
Per Schedule	<u>\$21,737.91</u>	<u>\$44,087.91</u>
Total Amount Billed	<u>21,737.91</u>	<u>44,087.91</u>
Total Charges Subject To Reimbursement	<u>\$21,737.91</u>	44,087.91
Payment Received		<u>22,350.00</u>
Net Amount Due UAF		<u>\$21,737.91</u>

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

CERTIFIED CORRECT


Thomas A. Gleason, CPA
Accountant, Grant and Contract Services

Vgl

cc: 252942

School of Management, University of Alaska Fairbanks

to: Molly
from: Jeff

Thanks for the new fan mail from Mark Herrmann. I have to admire Marks ingenuity in finding new and creative ways to blame FRED Division for everything that has gone wrong in his life.

Seriously, I am sorry that you have been exposed to this. After I sorted through Marks accusations, false information, and threats, it was apparent that I needed a copy of the documents that you sent to him to offer a response. After looking at the RSA and final UAF proposal and talking with our ADF&G RSA specialist, I would be in a better position to offer some suggestions.

Incidentally, Jenifer Childress, of ADF&G made the final payment for this RSA on February 13 and the check was cashed by UAF on March 3 (see attached). All of Marks puffing about not being paid, and having to bear costs out of his own pocket for the remaining expenses, appear to be a snow job. What is going on up there?

Also, I sent Jeff Koenings a response to Marks first emotional outburst letter to you of March 2. I have not sent it to you because I felt that it was beneath me to respond to Marks original commentary on FRED. Since I see more of the same misinformation in this memo, I will ask Jeff if he wants to send it to you.

final bill
sent ÷

→ ~~AK~~ Günning *

3/23/93

Draft RSA was never revised because
superseded by contract.

It was clear we were asking for more
than we could get

What Hartman proposed - was unreasonable.

have FRED Dir. for PC -

a letter can serve as a contract -

FRED D.
not a contract between FRED & Univ. ÷

-	<u>CPEC</u>
-	<u>Leg. Affairs</u>
-	<u>Hallford</u>
	<u>OMB</u>

Letter to Koenigs. Hermann will provide the
final simulations in SAS -

cc: to Hermann

huge model.

more iterations.

in AK - we have a model - ~~summary~~ model

too complex to be housed & run in **ADF&G**,
contributed to university modelling.
turf battle.

called
Mark Hermon - on 3/23/93

Told him to write me w/
what he thinks is reasonable to
complete project.

~~draft~~

474-5219 - FAX #

John Boyce -

out of town for past 3-4 wks.

final copy -

mid April. still not finished re-write of fishing
cost model. need it done by April 15 for
presentation to Norway.

Nothing will change in tables & results -
Ginny had given editorial comments -
had spent 3/4 time of report on things that didn't
work.

When - is more complete than what final will be.
ask Ginny if she has a draft

Mark Herrmann
School of Management
University of Alaska Fairbanks
Fairbanks, AK 99775-1070

Jeff Koenings, Director
FRED Division
AK Department of Fish and Game
P.O. Box 25526
Juneau, AK 99802-5526

John Lehman
Dean, School of Management
University of Alaska Fairbanks
Fairbanks, AK 99775-1070

Carol Lewis
Chair, Natural Resource Department
University of Alaska Fairbanks
Fairbanks, AK 99775-1070

Bob Logan
Chair, Department of Economics
University of Alaska Fairbanks
Fairbanks, AK 99775-1070

Diane Bischak
Department of Business Administration
University of Alaska Fairbanks
Fairbanks, AK 99775

Joshua Greenberg
School of Agriculture and Land Resources Management
University of Alaska Fairbanks
Fairbanks, AK 99775

Keith Criddle
Dept. of Economics
UAF 99775

John Boyce
Department of Economics
University of Alaska Fairbanks
Fairbanks, AK 99775

MEMORANDUM

STATE OF ALASKA

TO: Jeff Hartman
Economist
Comm. Fish. Mgmt. and
Development Division
M/S: 1100

DATE: April 19, 1993

FILE NO:

TELEPHONE NO: 789-6160

FROM: Kurt Schelle ^{MS}
Project Leader,
Research & Planning
C.F.E.C. M/S: 0302

FAX: 789-6170

SUBJECT: Review of Proposed
Professional
Services Agreement.

I did not receive your April 7th memorandum until last Friday afternoon (April 16th). Apparently there was some mix-up in the routing. I hope that this response is still useful to you.

I am not sure who has experience with both salmon market research and the use of large (48/36 equation) and complex econometric models for forecasting. I am also not sure who has extensive experience with the Bayesian Bootstrapped two-staged least-squares estimation methodology for multi-equation econometric models.

Perhaps Dan Huppert at the University of Washington or Richard Johnson at Oregon State University would have some suggestions. I believe Johnson has some experience with salmon demand modeling and was one of the founders of the "International Institute of Fisheries Economics and Trade".

I have attached a copy of a recent survey article published in Marine Resource Economics titled "Seafood Demand and Market Analysis". The article was co-authored by Cathy R. Wessells and James L. Anderson.¹ Their bibliography might provide you with some other potential candidates for the proposed technical review. From previous conversations, I understand that you may have "conflict-of-interest" reservations about contracting with some of the cited authors.

With respect to your project description, I have attached a few additional questions about the salmon market model and the "15/30-year" simulation forecasts. You may want to add some of these to your list if you feel that they are not already covered. Ben Muse will send you some additional questions on John Boyce's cost/net return models.

I would offer the following suggested change for the first three paragraphs of the section titled "Why the project is needed".

¹Note that the article reviews Herrmann's 1990 dissertation on world salmon trade and contains some cautionary notes on applying the Bayesian bootstrapping technique.

The authors of the UAF CBA study raised significant policy issues based upon the forecasts in their report. The forecasts were made with a complex multi-equation econometric simulation model and required many assumptions about the values of exogenous variables thirty years out into the future.

Economists in the Department and in the Legislature who reviewed the study raised many questions about methodology, assumptions, and procedures. Nevertheless, given the great complexity of the models, the Department feels that it would be best to seek a thorough professional review by someone who is an expert in all the requisite areas. The reviewer should be knowledgeable on salmon markets, be familiar with the Bayesian bootstrapped two-stage least squares estimation technique, and be familiar with forecasting with a large and complex multi-equation simulation model.

The salmon market component of the UAF CBA study is large and technically complex. One bloc of the model contains 48 equations and the second bloc contains 20 equations. A single simulation takes several hours on a 486 33 MHZ computer. The researcher in charge of developing the salmon market model described the model as "one of the largest economic simulation model of its type in the world".

Other technical questions, . . .

Again, I hope that this memorandum and our attached questions are useful to you. Please let me know how we can be of further help.

Attachment.

cc:

Jeff Koenings
Johnny Holland
Molly McCammon
Ben Muse

Guideline Questions
For the Professional Review
Of The Herrmann/Greenberg Salmon Market Model
(K. Schelle's notes: 4/19/93)

1. The model was "run" over the estimation time period so that simulation statistics could be calculated for the endogenous variables to see how the model performed. Do the simulation statistics indicate that the model "tracks" relatively well over the estimation time period?
 - a.) Do you feel that any variables track poorly over the estimation time period? What are these variables?
 - b.) Does the tracking of particular variables over the historical period raise any concerns about how the model might perform during the 15/30 year forecast period?
 - c.) Are the simulation statistics reported for endogenous variables over the estimation time period based on the same multi-equation model that was used to make the 15/30 year forecasts? If not, would it be prudent to redo the simulation statistics using exactly the same model that was used to make the simulations?
 - d.) Are there any portions or sections of the Bloc one model which raise concerns? Do you have any idea why the Atlantic salmon portion of the Bloc might perform poorly (and need to be dropped from the simulation model) during the simulations?
 - e.) Do you have any concerns about the model specifications, the estimation techniques, or the variable definitions used by the authors?
 - f.) Do you have any concerns about how certain variables were calculated?
 - g.) Would you have any suggestions for different model specifications?
 - h.) Do you have any reservations about the Bayesian bootstrapped two-staged least squares estimation technique which the authors utilized?
 - i.) Do you have any concerns about the procedures used to estimate species and area specific ex-vessel salmon prices in Bloc 2 of the model?

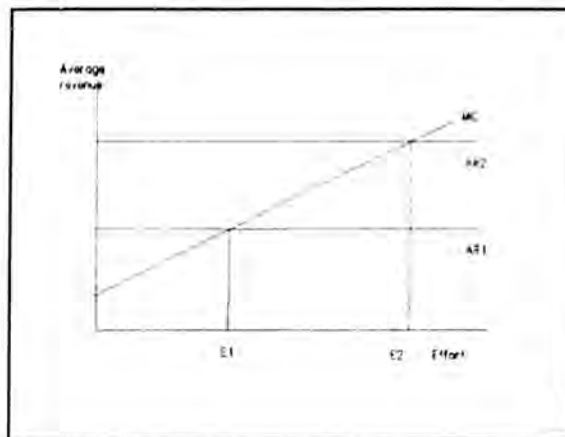
2. All forecasts require the use of "judgement" irrespective of how they are made. Forecasts of the future are not scientific exercises, even if they are made from complex empirically-derived econometric models. The following questions ask for your expert opinion on the assumptions and procedures used by the authors and the confidence which the State of Alaska should place in the results.

- a) The authors seem to imply that the model produces unrealistically high prices during the 15th year of the simulation. Does this raise concerns about the dynamic stability of the Bloc One model?
- b) The Atlantic salmon portion of Bloc One apparently had to be eliminated to do the simulations. Key variables from this bloc were made exogenous and took on assumed values. Do you see any obvious specification problems with the original Atlantic salmon portion of Bloc One that would impact the dynamic stability of the overall model or otherwise bias the results?
- c) In making 15/30 year forecasts into the future from a complex econometric simulation model, values for all of the exogenous variables need to be assumed.
 - i) In your judgement, are the values assumed for the exogenous variables in the mid-point simulations reasonable? Do any of the assumptions about particular variables seem unrealistic or give you cause for concern? If so, what assumptions or range of values would you recommend using for the variables in future simulations?
 - ii) Are the assumptions used by the authors for the high, low, and mid-point price predictions clear to you? Which exogenous variables have been increased and which have been decreased for the high and low scenarios?
 - iii) Which exogenous variables, if any, do you feel could substantially alter the results of the Bloc One model? Do you think that other plausible assumptions for these variables would ultimately alter the CBA results? If so, what are those assumptions?

- iv) What sensitivity analyses, if any, would you recommend?
- v) Does the use of 1991 dummy variables (the last year of the estimation period) in the specification of certain equations raise any concerns during the forecast period? Do the authors' arguments for setting D91 equal to zero during the forecast period in the low-valued salmon equation and equal to one during the forecast period in the high-valued salmon equation seem reasonable? How do these assumptions impact the results?
- d) Is there any way to estimate confidence intervals around the point estimate forecasts of the endogenous variables in the model? If so, how would the intervals be interpreted?
- e) Given the complexity of the CBA model (all components combined), is there any way to assign a confidence interval to the final "point estimate" of net economic benefits forecasted under particular scenarios?

Guideline Questions
For the Professional Review
of the Boyce fishing cost model
(B. Muse's notes 4/20/93)

- 1 Does the model define the marginal costs of an effort increase to be the total variable costs of an additional operation entering the fishery? Does this underestimate the marginal costs associated with a change in average revenues by ignoring the possibilities (a) that existing operations may expand effort in response to higher average revenues, and (2) that the entry of new operations may impose technological externalities on existing operations? Does this bias estimates of cost changes associated with effort changes? Is any bias likely to be significant?



Effort is measured by the number of separate operations active within an area. At the effort level $E1$, above, a new operation is assumed to have entered the fishery when average revenues rose to $AR1$. Presumably at this point the average revenues have risen to (or just above) the minimum point on the new operation's average variable cost curve and the operation has found that it can minimize its losses by beginning to operate and covering at least part of its fixed costs for operating that day. The total variable costs of this operation's activity for the day appears to be the model's measure of the aggregate fishery marginal costs.

In order for the estimated marginal cost curve to be the actual aggregate industry marginal cost curve we have to assume that, as average revenues rise and new operations enter the fishery, the cost curves for operations already in the fishery remain the same. We also have to assume that these operations do not change their own effort levels and increase their average variable costs as new operations enter the fishery. If the cost curves rise because of external effects imposed by the new operations, or if operations already in the fishery expand their effort levels and increase their total variable costs, the actual marginal cost curve at $E1$ might lie above the estimated marginal cost curve.

- 2 Does the short run nature of the analysis suggest that some costs, sunk from the point of view of a single day of fishing, may not be considered by the model? Does this bias estimates

of cost changes? Is any bias likely to be significant?

The model estimates marginal costs associated with a day's decision to fish. There are costs which are sunk from the point of view of a single day's fishing and which may not affect decision making in this short run.

As an example consider a fisherman who has come to Prince William Sound from out of state to seine for salmon. He has come to spend the season. On any given day he faces a choice of whether to stay at the dock or to go to one of several fishing grounds. He has, however, committed his time to this fishery in advance of the season. Does this mean that from the point of view of the one day decision, his opportunity cost of time is a "sunk cost" and not a choice variable, and may not be reflected in the aggregate marginal cost curve constructed for this model.

Is this opportunity cost, from the social cost-benefit point of view, a real cost which it is desirable to measure.

- 3 Can the model be used to evaluate a long term (15 or 30 years) change in harvest levels given the extremely short run (a day long opening) nature of the data used to estimate the cost model? Can the model successfully account for longer term effort and cost adjustments? If it can't, does this failure tend to bias the results in any direction? Is any bias likely to be significant?
- 4 To the extent that marginal costs include raw fish taxes and other transfer payments do these marginal costs overestimate marginal social costs? This question was suggested to me by Jeff Hartman.
- 5 Presumably crew shares are costs to decision makers and are reflected in the marginal cost curves. But can crew shares include an element of rent? If so, do marginal costs overestimate marginal social costs to the extent that they include crew share rental payments? Is there a way these crew share rental payments could be netted out of the analysis?
- 6 Does the failure of the model to differentiate between resident and nonresident fishermen tend to lead to over or underestimates of the benefits to the state of changes in hatchery production?

House committee to review salmon enhancement program

By Eric Fry
Alaska Journal of Commerce

The state House Special Committee on Fisheries will begin hearings in early April on the salmon hatchery

program, says Molly McCammon of the committee staff.

Twelve state and 25 private, non-profit hatcheries together produce about one-quarter of Alaska's commercial salmon harvest.

The legislative review is partly intended to give the Board of Fisheries clearer direction on managing mixed-stock fisheries, providing for broodstock, and providing for fisheries that help recover the hatcheries' costs.

costs.

The House hearings continue a process that began in the Senate in 1991.

Last summer the Legislature established a wild-stock priority and told the fish board to develop a mixed-stock policy.

But there is no clear policy for the hatcheries, now that the original goal has been met of rehabilitating the state's depressed stocks, the executive summary report said.

McCammon said that some scientists are concerned about the biological impact of producing more salmon, especially since the Russians and Japanese have increased their production. Scientists fear that the Pacific Ocean could be reaching its carrying capacity for salmon, she said.

The world supply of salmon from all sources doubled between 1980 and 1990—and prices have fallen.

Between 1988 and 1991, the average price Alaska fishers received for sockeyes fell from \$2.35 a pound to 77 cents a pound. The prices for pinks tumbled from 79 cents a pound to 13 cents, according to a 1992 report by Gunnar Knapp of the University of Alaska Anchorage.

The committee will review the regional planning teams that consider hatchery permit applications and develop comprehensive hatchery production plans.

The planning teams do not take into account the impact that production in one region has on other areas of the state, the report said.

A frequent complaint is that the planning teams are heavily weighted in favor of the commercial fishing industry and do not represent sport fishers, subsistence users and environmentalists, the report said.

"Another, more fundamental concern is that (Fish and Game Department) managers are usually outnumbered on the (planning teams)," the report said.

"As a result, the group can pressure department managers into approving projects that should probably be denied. ... There is also concern that the non-Fish and Game members of the (planning teams) may not be sufficiently capable of evaluating and making decisions on issues that are increasingly technical in nature," the report said.

And then there's money.

Since the salmon enhancement program began in 1972, Alaska has provided \$71 million in loans and \$12 million in grants to the private hatcheries.

And the state has spent about \$210 million in the past 20 years to run the Division of Fisheries Rehabilitation, Enhancement and Development.

Part of the legislative review is a controversial economic study that compared state funding of the salmon hatcheries with fishers' revenues.

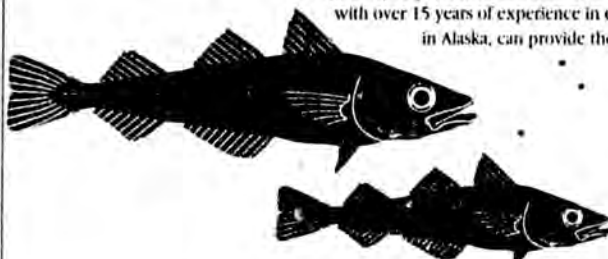
The study's conclusion: Eliminating the pink salmon hatcheries would reduce supply and might drive prices up.

The study also estimated that operating hatcheries at current production levels would cost the state \$420.2 million over the next 30 years but would produce only \$390 million in net revenues to fishers.

The report, by four University of Alaska Fairbanks professors, has not

Continued on Page 4C

ALASKA'S SEAFOOD PROCESSING INDUSTRIES are faced with implementing an increasing array of regulatory requirements to obtain or maintain NPDES Discharge Permits. Jones & Stokes Associates, with over 15 years of experience in evaluating seafood processing and other NPDES Permit issues in Alaska, can provide the expertise to meet these regulatory requirements, including:



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Alaska Native a likely choice for next North Pacific council seat

By Eric Fry
Alaska Journal of Commerce

Gov. Walter J. Hickel has nominated two Western Alaska Natives and a Gulf of Alaska fisherman as possible replacements for Henry Mitchell on the North Pacific Fishery Management Council.

Nominated were John Jemewouk, executive director of the Norton Sound Economic Development Corp.; Robin Samuelson, chairman of the Bristol Bay Economic Development Corp.; and Andrew Scalzi, a longtime fisherman and vessel owner, who is on the Kenai Peninsula Borough Assembly.

Hickel spokesman John Manly said Western Alaska Natives are a user-group that is heavily impacted by the council's decisions. Part of Hickel's intent is to see Natives represented on the council, Manly said.

The governor of Alaska nominates five of the 11 voting members of the North Pacific council, which manages commercial fisheries in U.S. waters off the Alaska coast. A sixth Alaskan, the fish and game commissioner, is automatically a council member.

The U.S. secretary of commerce makes the final three-year appointments, after review by the National Oceanic and Atmospheric Administration.

Jemewouk, who was reported by the Associated Press as Hickel's preferred candidate, said in an interview that he is excited by the prospect. "I look at it as a new perspective on the council."

He supports individual fishing quotas "to where it brings a better quality

product to market and helps support a wider range of people."

The community-development-quota program has benefits and shortcomings, Jemewouk said. "It helps get people off welfare and into jobs in the fishing industry."

As far as CDQs being extended to the Gulf of Alaska, Jemewouk said that many Southeast communities already are on the fishing grounds, but "there's some areas that could be developed."

In addition to heading the Norton Sound CDQ program, Jemewouk is a member of the National Indian Health Board and the Alaska Native Health Board, which he chairs.

Jemewouk was president of KEG Fish Co. from 1984 to 1989 and of the Elim Native Corp. from 1984 to 1987. He was born in the Eskimo village of Elim in 1951. His father is an Inupiat Eskimo from White Mountain, Alaska, and his mother is a Yupik Eskimo from Elim.

Henry Mitchell, who is executive director of the Bering Sea Fishermen's Association, has served on the council since 1984. His term will expire in August.

"Henry did an excellent job," said Clem Tillion, alternate council member, who cited Mitchell's work on the CDQ program.

CDQs at the table
Both Jemewouk and Samuelson head community-development-quota programs that have benefited from recent council decisions.

The North Pacific council allotted 7.5 percent of the Bering Sea and

Aleutian Island regions' 1992-95 pollock quota to Western Alaska communities, which formed six development groups to harvest the fish with trawling company partners. The quota shares are worth collectively tens of millions of dollars over several years.

Community development quotas also are worked into the newly approved individual-fishing-quota plan for halibut and sablefish, which may go into effect in 1995 or later.

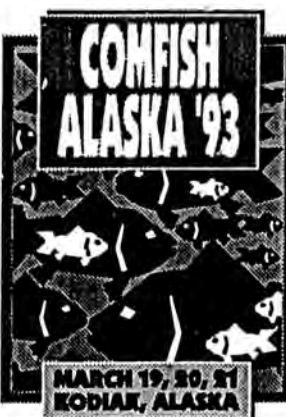
The IFQ plan gives transferable quota shares to vessel owners and leaseholders based on their recent catch history.

But some quota shares will be taken from each Bering Sea and Aleutian

Islands management area and given to nearby communities, which will distribute the shares among individual fishers. Non-CDQ fishers are expected to lose about 3.5 percent of their initial quota shares to CDQ fishers.

The pollock CDQ programs will not necessarily be the recipients of halibut and sablefish CDQ shares. In the IFQ plan, the CDQ shares come from particular management areas and must be fished from local communities only.

In the pollock CDQ plan, the recipients can fish anywhere in the Bering Sea and Aleutian Islands management areas.



In February, Gov. Walter J. Hickel received an \$18,000 voluntary payment from Mark Sngaroff, chairman of the board of the Aleutian Pribilof Island Community Development Association. The payment was in lieu of the state raw-fish tax that would have gone to the general fund had the CDQ group used an onshore processor for all of its harvest. APICDA formed a joint venture with Trident Seafoods Corp. and the Starbound Partnership to harvest its share of the CDQ pollock. Catcher vessels delivered about 70 percent of the fish to Trident's shoreside Akutan plant, but one factory trawler was used. In all, APICDA paid about \$80,000 in raw-fish tax in 1992.



PHOTO BY STEVE STICKLAND

Joe Blum, left, of the American Factory Trawler Association and John Roos of the Pacific Seafood Processors Association receive the first installment of a \$100,000 research grant to the Marine Mammal Research Consortium from Fred Richard, right, senior vice president of the National Bank of Alaska.

The consortium was formed by seafood companies to investigate the decline of marine mammals in the Bering Sea. Environmentalists have sought to link the decline to the commercial fishing of pollock, one of the mammals' food sources. Universities in Alaska, Washington state, Oregon and British Columbia will perform independent, peer-reviewed research, focusing on the Steller sea lion and harbor seals. The consortium hopes to raise \$900,000 over three years. Research is expected to begin in April. The federal Marine Mammal Protection Act is up for reauthorization this year. The National Marine Fisheries Service has recommended for discussion a regime that includes marine mammal quotas for certain species, and no legal takes for severely depleted species.



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House committee to take hard look at salmon hatchery program

Continued from Page 2C

yet undergone peer review or public comment.

Representatives of private hatcheries said the report's methodology is flawed and the results may not be

statistically significant.

"The Department of Fish and Game is contracting for an independent technical review of the study," said a statement from Rep. Carl Moses-Al-Unalaska, who chairs the committee, "and I invite other interested groups

to do the same."

Not enough supporting documents have been released to make that possible, said Heather McCarty of the Prince William Sound Aquaculture Association, the state's largest producer of hatchery salmon.

The study, which used an innovative method of computer modeling, also had some limitations built into it, the authors said.

having no hatcheries—but all other regions would gain, the study said, particularly Prince William Sound.

Eliminating the pink salmon hatcheries would cause revenues to rise in Western Alaska, Kodiak and Southeast but drop in Cook Inlet and Prince William Sound, the study said.

Hatcheries accounted for 42 percent of the pink salmon harvest in Prince William Sound but only 3.8

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PHOTO BY STEVE MCCUTCHEON

By the terms of the contract, the professors measured only the direct economic benefits of hatcheries to commercial fishers and ignored indirect impacts such as fish processing jobs, as well as all social considerations.

And the report took no account of the hatcheries effects on sport or subsistence fishing.

The researchers were asked to look at 17 possible policies for managing the hatcheries over the years 1992-2021, including increasing, decreasing or eliminating the production of the various species (see the chart on page 5C).

One significant conclusion: The state's regions are affected differently by hatchery production because of varying amounts of wild salmon in the regions' stocks.

Those regions with an abundance of wild salmon would have higher revenues in a market that wasn't glutted, partly with hatchery fish.

At current hatchery production levels, Western Alaska would lose revenues over 30 years, compared with

percent in Southeast.

McCarty said one of the study's major flaws is that it took the highest production year since 1900 as the base, although salmon returns are cyclical.

Others will fill the gap if Alaska reduces production, she said. "Instead of attacking the problem from the marketing point-of-view, they assumed that you should just cut production."

In 1980, Alaska salmon harvests were 41 percent of the world salmon supply. By 1991, this had dropped to 31 percent, although Alaska produced 50 percent more salmon than in 1980.

Meanwhile, farmed salmon production nearly doubled between 1988 and 1990 to compose 30 percent of the world salmon supply.

In 1980, it was 1 percent.

Norway produces about half the world's farmed salmon, but production is expanding in Scotland, Japan, Canada and Chile, said Knapp's 1992 report.

McCammon said the House committee hopes to hold hearings on the economic report by mid-April.

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Gulf groundfish allocations face further delay

By Eric Fry
Alaska Journal of Commerce

The Alaska regional office of the National Marine Fisheries Service has resubmitted the recommended specifications for Gulf of Alaska groundfish to the U.S. secretary of commerce. A decision is expected by March 26, said Ron Berg of NMFS' Alaska office.

Approval of the specifications for total allowable catch, set by the North Pacific Fishery Management Council in December, have been delayed by a dispute over Pacific ocean perch.

The council recommended a catch limit of less than half of last year's, contrary to the council scientific committee's recommendation. This limit would render Pacific ocean perch bycatch-only and kill a Seattle-based trawler fishery worth about \$3.4 million a year.

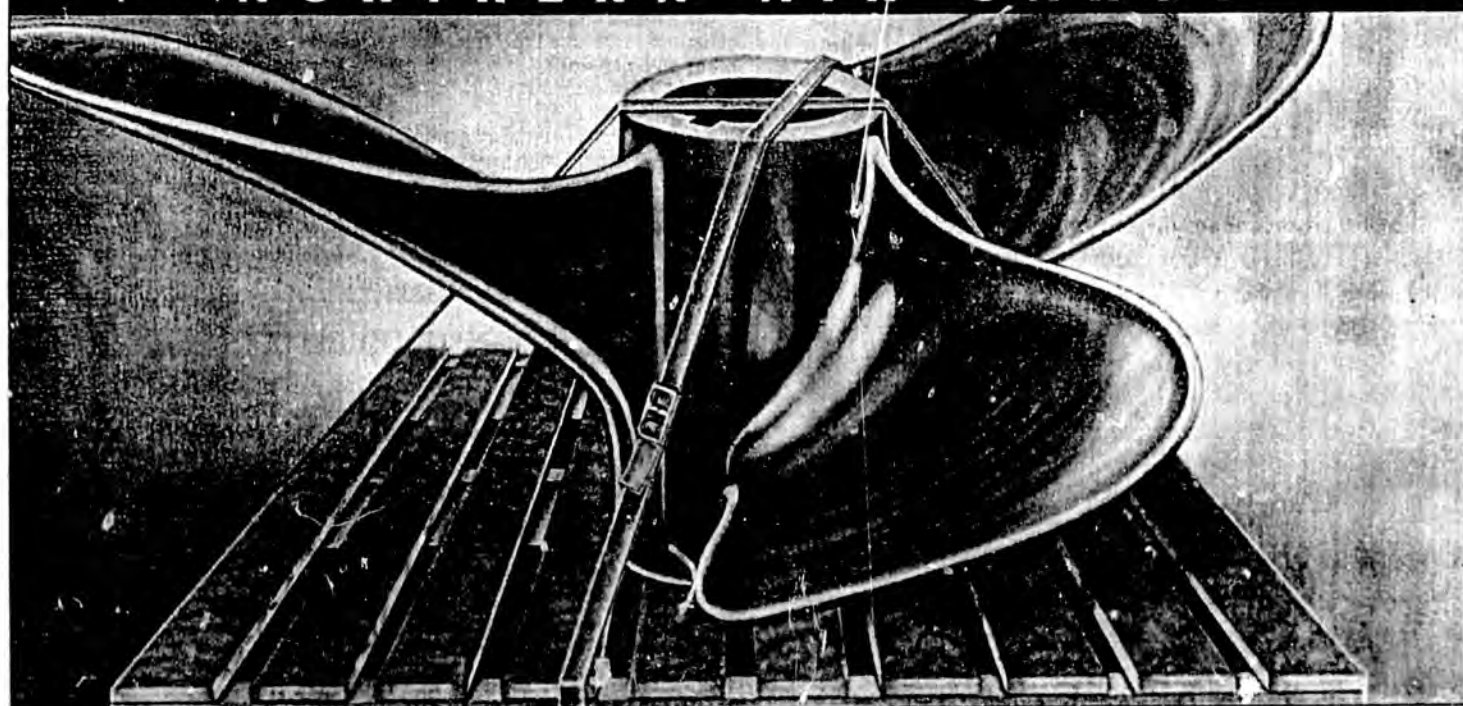


Net benefits of the Alaska salmon fisheries with changes in hatchery production

Possible policy choices	Western AK	Cook Inlet	Kodiak	PW Sound	Southeast
Current production (All policy choices are figured over period of 1992-2021)	\$993.40 million (1992 dollars, discounted at 4%)	\$276.55 million	\$288.69 million	\$126.63 million	\$737.78 million
Eliminate pink program	1,016.91	271.01	312.64	95.02	874.81
Eliminate sockeye program	1,036.43	284.07	258.72	119.11	754.07
Increase pink 15 percent	990.19	277.31	281.15	116.59	712.88
Decrease pink 15 percent	996.61	276.73	293.54	131.11	758.86
Increase sockeye 15 percent	987.77	276.36	292.62	126.74	724.09
Decrease sockeye 15 percent	999.17	277.54	284.79	126.65	740.23
Increase chum 15 percent	992.53	276.15	286.22	123.13	736.14
Decrease chum 15 percent	994.43	276.92	289.33	126.07	726.29
Increase coho 15 percent	991.88	275.69	288.26	130.46	734.24
Decrease coho 15 percent	994.02	276.82	289.03	126.11	735.76
Increase king 15 percent	992.97	277.32	288.49	130.77	736.89
Decrease king 15 percent	993.94	276.81	288.90	126.69	732.94
Planned production	955.09	296.22	274.52	157.15	713.85
Eliminate program	1,109.59	288.91	309.48	144.29	863.69
Increase all species 15 percent	978.03	274.76	277.56	114.16	674.43
Decrease all species 15 percent	1,005.97	278.71	288.50	145.08	736.28

SOURCE: A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. Net benefit is the return to fishers minus fishing costs and the cost of hatcheries.

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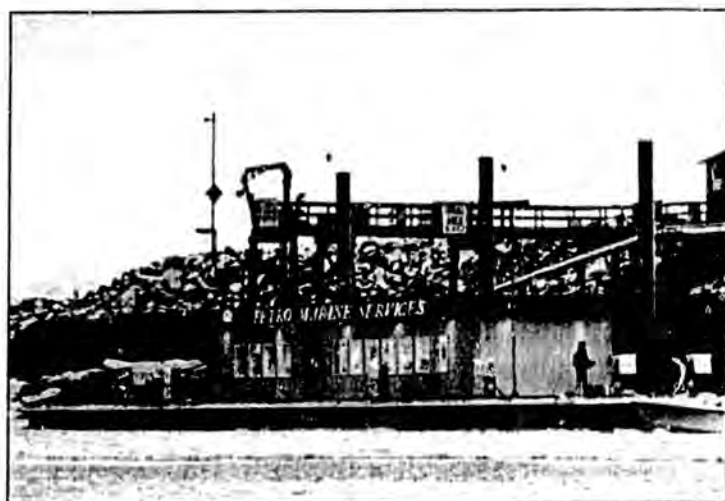


PHOTO COURTESY CeFer DESIGNS

Petro Marine installs concrete floating gas barge at Homer

By the Alaska Journal of Commerce

A Canadian firm that specializes in custom designing and construction of concrete floating structures has completed a concrete floating gas barge at Homer for Petro Marine Services.

The 100 by 30 by seven-foot-deep Petro Marine concrete barge has many special features, said Jack Henwood, spokesman for CeFer Designs, in Richmond, B.C.

These include covered, recessed service trenches that house fuel lines and other services, and are designed to trap any spilled fuel and liquids. Trapped fuel and other contaminated liquids are then drained into a sump or catch basin.

The office and retail outlet superstructure is attached to a raised concrete pad not unlike the pad for a conventional slab home, Henwood said.

Explosion-proof electrical conduits run below deck through selected compartments of the barge to the fuel dispensing pumps and other electrically driven apparatus.

"We were looking to design and

construct a 'Cadillac' fuel/C-Store float for our Homer retail operation and from CeFer we received a quality product in all respects," said Don Ennis, vice president of Petro Marine's construction and special projects division.

Securing of the barge is accomplished by use of heavy-duty pile brackets around steel piles, Henwood said. The design of the barge also had to take into consideration the 1,400-mile tow from Vancouver to Homer. Several extra post tensioned cables were incorporated into the hull of the barge to ensure structural strength for the tow.

CeFer Designs' construction method also is used in construction of fish holding and fish processing barges, aquaculture barges, floating breakwaters, machinery platforms, floating camps, floating homes/offices/restaurants, heavy-duty vessel moorage, and marine floats.

Over the past 26 years, CeFer has built 50-60 concrete marine fuel dispensing floats and barges, Henwood said. Its customers have included major oil companies with marine outlets in British Columbia, he said.

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ComFish boosts Kodiak economy

By the Alaska Journal of Commerce

ComFish Alaska '93, a three-day trade show for commercial fishers, is expected to bring a \$300,000-\$500,000 boost to the economy, says Wayne Stevens of the Kodiak Chamber of Commerce.

"It's the only time in the entire year I know I'm going to be full," said Ken Houston, manager of the 81-room Westmark Kodiak hotel.

The chamber expects about 5,000 ComFish attendees over the three-

day period, with up to 20 percent from outside the island.

Exhibitors will fill 130 booths (see list Page 8C), and salespersons should find plenty of customers in Kodiak, one of the nation's busiest fishing ports.

"It's a heck of a shot in the arm in a slow season," Stevens said. Hotels, bed-and-breakfasts, car rental agencies and restaurants should be busy, he said. The chamber begins preparations in August and relies on the help of 10-15 volunteers, Stevens said.

NOAA sets nautical chart meeting

By the Alaska Journal of Commerce

Officials of the National Oceanic and Atmospheric Administration plan a nautical chart users meeting April 16 at the Anchorage Hilton.

A primary objective will be to provide chart users an opportunity to communicate their specific charting and survey requirements for Alaska waters, said NOAA Lt. Cmdr. John Wilder.

NOAA officials plan to make brief presentations on the condition of Alaska charts, plus current and future hydrographic survey projects.

Fisheries groups working in Alaska waters have been invited to attend, said Lt. Mark Larsen, NOAA liaison officer at Anchorage.

For further information, contact Wilder at 301-443-8752, or Larsen at 271-3153.



Schedule of ComFish Alaska '93 workshops and events

Friday, March 19

10 a.m. - "LifeRing On Call Physician Program for Fishermen," ComFish Hangar Seminar Room, presented by Kodiak Island Hospital, Dr. Mark Withrow.

11 a.m. - "Search & Rescue Procedures," ComFish Hangar Seminar Room, presented by U.S.C.G. Air Station Kodiak. Includes video and tour of new H-60 helicopter.

11:30 a.m.-1 p.m. - "The Future of the Alaskan Salmon Industry," featuring Paul Fuhs, commissioner of the state commerce department; and Chris Mitchell, executive director of the Alaska Fisheries Development Foundation, Westmark Harbor Room, luncheon buffet, sponsored by Kodiak Chamber of Commerce and Kodiak College.

1 p.m. - "RSW Systems," ComFish Seminar Room, presented by Thermal-Tec.

2 p.m. - "Business Cash Management," ComFish Seminar Room, presented

by Dean Witter/Reynolds.

2 p.m. - "Legal & Insurance Matters for Fishermen," Westmark, seminar and refreshments, sponsored by Sea-Pac.

3-4:50 p.m. - "Overview of C-Plans & OPA-90 Legislation," for fishing industry, ComFish Seminar Room, presented by North Coast Research Group, Tim Robertson.

5 p.m. - "Filtration/Oil & Fuel," ComFish Seminar Room, presented by DSR.

5 p.m. - Russian dinner at the Russian Orthodox Church.

6 p.m. - Reception at the Buskin River Inn, featuring Clarence Pautzke, executive director of the North Pacific Fishery Management Council, sponsored by Womens' Fisheries Network & World Express Travel, open to the public.

Saturday, March 20

9 a.m.-noon - "You and the IRS," Westmark, featuring attorneys, tax accountants, lenders and consultants,

sponsored by CFAB, the Alaska Business Development Center and the state Division of Investments.

10 a.m. - "Retirement Planning," ComFish Seminar Room, presented by Dean Witter/Reynolds.

11 a.m. - "Alaska Weather," ComFish Seminar Room, National Weather Service.

Noon - "Onboard Freezing," ComFish Seminar Room, presented by Thermal-Tec.

1 p.m. - "Untangling Tax Snags," ComFish Seminar Room, presented by the Internal Revenue Service.

2-3:45 p.m. - "Cold Weather Survival/Hypothermia," ComFish Seminar Room, presented by the Kodiak Island Hospital, Dr. Marty Nemeroff.

4 p.m. - "Lube," ComFish Seminar Room, featuring a Mobil representative, sponsored by Petro Marine.

5 p.m. - "Search and Rescue Procedures," ComFish Seminar Room,

U.S.C.G. Air Station Kodiak, video and tour of new H-60 helicopter.

6:30 p.m. - Reception, Westmark Harbor Room, sponsored by L&S Travel, Kodiak Fishermen's Wives & Westmark, seafood, no-host cocktails, all are welcome.

7 p.m. - "Gold Rush Days," Golden Anchor, no-host bar, auction, poker, roulette, proceeds to charity, admission \$5, open to public, sponsored by Officer's Wives Club.

Sunday, March 21

11 a.m. - "Alaska Weather," ComFish Seminar Room, National Weather Service.

1 p.m. - "Search & Rescue Procedures," ComFish Seminar Room, U.S.C.G. Air Station Kodiak, video and tour of new H-60 helicopter.

2:30 p.m. - "Tribal Proposed CCS Sale #149 in the Shelikof," ComFish Seminar Room, Minerals Management Service, discussion and questions.

ALASKA'S LARGEST MARINE CARGO/TRANSPORT COMPANIES

(Ranked by Total Weight (in tons) Hauled in 1992)

Rank	Company Name, Address & Phone Number	Weight in Tons Hauled in 1992	1992 Gross Billings	No. of Vessels Company Owns	No. of Employ, No. of Locations	Year Est.	President/ CEO	Types of Vessels Owned by Company	Areas & Frequency Sailed by Co. Vessels	Type of Cargo Company Hauls*					
										Refrig.	Dry	Brk Bkt	Hvy Lift	Ro Ro	Other
1.	Foss Maritime Company 660 W. Ewing Street Seattle, WA 98119 206-281-3855	750,000	n/r	160	36 2	1934	W. Madigan Oper. Mgr. Alaska	Tugs/Supply Boats/General Cargo Barges/Regined Petroleum Barges	Haul by sailings as required by cust.; move refined petro. in bulk w/in AK full time; moves entire annual output of Red Dog Mine.	x	x	x			
2.	Arctic Tug & Barge Co., Inc. 1200 Ocean Dock Road Anchorage, AK 99501 278-5558	400,000	n/r	2	9 1	1986	David Pickworth Oper. Manager	Tugs & barge.	Cook Inlet, Beluga, Trading Bay, Tyonek, all beach landing areas in Cook Inlet, Homer and Seldovia.					x	
3.	Alaska Marine Lines, Inc. 100 Mt. Roberts Road Juneau, AK 907-950-4265	252,000	n/r	5	80 8	1967	Alex McKillop President	Flatdeck barge, dry, refrigerated, dry bulk, liquid bulk in 20', 24', 40' containers.	Between Seattle & SE Alaska twice a wk. Seattle & Yukon Terr. & AK Interior via Haines & Skagway once a week.	x	x	x	x	x	x
4.	Anderson Tug & Barge Co. 909 3rd Avenue Seward, AK 99684 224-5508	150,000	n/r	4	15 1	1978	John C. Anderson III President	Ocean tugs and barges.	West Coast of United States, Out of Alaska, primarily between Pacific NW and all Alaskan ports, year-round service.		x	x	x	x	x
5.	Yutana Barge Lines, Inc. 450 Front Street Nenana, AK 99780 832-5563	80,000	\$8,000,000	20	103 103	5	Larry Shalver Manager V.P.	River & Coastal Tugs - combination fuel and cargo barges.	From the Tanana & Kogukuk Rivers, Norton Snd, Nome to Hooper Bay & all pts. between. Hqd. in Nenana & St. Michaels.	x	x	x	x	x	x
6.	Maruk Freight & Salvage Box 1485 Homer, AK 99603 235-7398	799	\$165,813	1	2 1	1989	Otto Kitcher Owner	LCM (landing craft).	Kachemak Bay, Cook Inlet, Kodiak.		x			x	
7.	Tutka Bay Barge Services Red Mountain Homer, AK 99603 235-8315	320	\$85,000	1	2 1	1989	Jack Estill Owner	LCM (landing craft).	Kachemak Bay, Cook Inlet, Kodiak.		x			x	
★ ★	Crowley Marine Services, Inc. 2401 Fourth Avenue Seattle, WA 98121 206-443-8100	n/r	n/r	450	200 12	1953	Brent Stenecker	Tugs, dry cargo deck, gen cargo, wrecks, ice bkt., dry dock petro., barges, rail car -floats barges, crew supply & water taxi.	W. Alaska thru-out season: Naknek, Olingham, Kuskokwim Rvr, Bethel Coast, Nome, Kotzebue, Lower Yukon, SSE Alaska.	x	x	x	x	x	
★ ★	Flynn's Barge Service, Inc. 345 W. Darling Hwy Homer, AK 99603 235-8624	n/r	n/r	2	5 1	1961	Wille Flynn President	Beach landing craft LCU - Fox River 118' CG certified, 85' tug	Coastwide					x	x
★ ★	Samsen Tug & Barge Co., Inc. Box 554 Sitka, AK 99835 747-4538	n/r	n/r	5	50 5	1935	George Bigger Owner	Tugs, flat-deck barges, ramp barges, bulk fuel barges.	Seattle to Sitka, Cordova, Valdez, Kodiak, Dutch Harbor, Adak. Service several Alaskan ports in spring and summer months.	x	x	x	x	x	x
★ ★	Tetlow Ocean Trailer Express, Inc. 1100 Olive Way, Suite 1100 Seattle, WA 98101 828-8218	n/r	n/r	3	33 3	1975	Jeff Kalk Alaska Gen. Mgr	RoRo - Roll-on/Roll-off	Port of Tacoma, WA to Port of Anchorage, AK	x	x		x	x	x

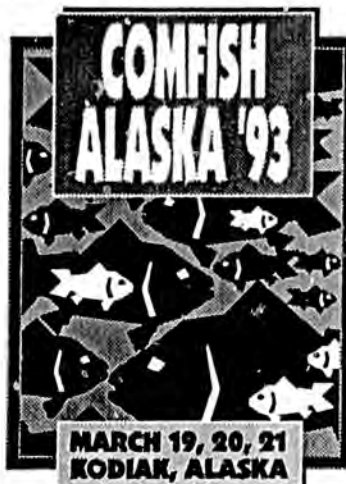
Please Note: A. ... marine Cargo/Transport Companies were contacted by fax 2 times over a 5 week day period for inclusion in this listing. Only companies who completed and returned a questionnaire by the deadline were included. Information was requested for Alaska operations only. * Under type of cargo hauls - Refrig. = Refrigerated, Brk. Bkt. = Break Bulk, Hvy. Lift = Heavy Lift, Ro Ro = Roll-on/Roll-off, n/r = Not Ranked. ** Indicates ranking information was not provided; companies who did not provide ranking info. are listed in alpha order at the bottom of the listing. Sources: Representatives from each company. The companies provide the information for the list and the AJOC takes the provider of the information at their word.

It is not the intent of this list to endorse the participants or to imply that the size of a company necessarily indicates its quality of service. To the best of our knowledge this information is accurate as of press time. While every effort is made to ensure the accuracy and thoroughness of the list, omissions and typographical errors sometimes occur. Please send corrections or additions on company letterhead to Debi Becker, Research Editor, The Alaska Journal of Commerce, PO Box 81418, Anchorage, AK 99509-1418.

Compiled by Debi Becker on Mar. 15, 1993

The ComFish Alaska '93 exhibitors, with booth numbers

300 - ACR Electronics Inc.
 711 - Aksala Electronics Inc.
 602 - Alaska Airlines
 419 - Alaska Commercial Fisherman
 705 - Alaska Commercial Fishing and Agriculture Bank
 910 - Alaska Dept. of Fish & Game
 215 - Alaska Detroit Diesel-Allison
 221 - Alaska Diesel Electric
 701 - Alaska Fisherman's Journal
 807 - Alaska Journal of Commerce
 721 - Alaska Regional Hospital
 909A - Alaska Seafood Institute
 907, 908 - Alaska Sea Grant College Program
 318, 320 - Alaska/Seattle Ship Supply
 502 - Alyeska Pipeline Services
 810 - American Red Cross Kodiak Chapter
 218 - Anchorage Cold Storage
 416 - AT&T Maritime Services
 719 - Authorized Marine & W.E. Stone
 202 - Bayleysuit Inc.
 322 - Boise Cascade Corp.
 616 - Cascade Machinery & Electric Inc.
 606 - City Market
 412, 414 - City of Kodiak
 619, 621 - Construction Machinery
 610, 612 - Crewsaver Liferafts/SMR Technologies
 518 - Cummins Northwest Inc.
 200 - Danzas Corporation



609 - Dean Witter/Reynolds Inc.
 407 - Division of Investments/CFEC
 116 - DSR Companies
 622 - Dunlop-Beaufort Canada Ltd.
 700 - Era Aviation
 110 - Food Service of America
 208 - Fred Wall Marine Construction
 216 - GR Battery Systems
 821 - Grainger Inc.
 105 - Grizzly Embroidery
 718 - Guzi Electronic Marine
 308 - Henry Vogt Machine Co. Refrigeration

405 - Independent Lift Truck of Alaska
 310 - Innovac Technology (USA) Inc.
 903 - Internal Revenue Service
 219 - International Paint/Courtauld's Coatings
 103 - J.C. Terpak Mechanical Maintenance
 302 - Jensen Maritime Consultants Inc.
 206, 305 - Joycrafts, Marine Safety Services
 904A - KANA
 717 - Klein Electric & Thissen and Associates
 911 - KMXT 100.1 FM Public Radio
 520, 522 - Kodiak Auto Center Inc.
 321 - Kodiak Diesel Service
 716 - Kodiak Electric Association
 816 - Kodiak Island Hospital and Care Center
 814 - Kodiak Island Sportsman Assoc.
 111, 113, 115 - Kodiak Marine Supply
 516 - Kodiak Rental Center Inc.
 421 - Koskovich
 902 - KVOK/KJJZ
 309 - Last Frontier Insurance Cache
 523 - LeClercq Marine Construction Inc.
 706, 708 - LFS Inc. & LFS Trawl
 211 - Marco Seattle
 117 - Marine Yellow Pages
 201 - MarkAir
 611 - Mid-Coast Marine Oregon
 519, 521 - Mill-Log Marine

715 - Minerals Management Service
 510, 512 - N C Machinery
 107 - Napa Distribution Center
 220, 222 - National Bank of Alaska
 906 - National Marine Fisheries Service
 901 - National Weather Service
 618, 620 - Net's-Pacific
 102 - New York Life Insurance Co
 707 - Nichols Bros. Boat Builders Inc.
 916 - NIOSH
 912 - NOAA/NESDIS
 905 - North Pacific Fishery Management Council
 600 - Northern Air Cargo
 401 - Northstar Sportswear Corp.
 515 - O. Mustad & Son (USA) Inc.
 210 - O'Kraft & Son-Kraft
 406 - Pacific Telecom Cable Inc.
 702 - Paine Webber
 601 - Penair
 415 - Permatex Industrial, Div. of Loctite
 106, 108 - Petro Marine Services
 720 - Port of Grays Harbor
 409 - PTI Communications
 418, 420 - Quality Marketing
 505-511 - Radar Alaska
 217 - Red & Don's Propeller & Welding
 900 - Regional Citizens Advisory Council
 301 - Rollins Hudig Hall-Marine Insurance
 712 - Sabro Refrigeration Inc.
 508 - Safeway Stores Inc.
 513 - Salamander Pads Inc.
 722 - Sally's Eyeland/Kodiak Vision Clinic
 121 - Sealand Services
 517 - Sea-Pac Insurance Managers
 119 - Servis Red Ball Xtratuf
 317 - Seward Ship's Dry Dock & Chandlery
 123 - Small World
 118-122 - Sulliff Hardware Inc.
 205, 207 - Switlik Parachute Co.
 311 - Teknotherm (US) Inc.
 306 - The Fisherman's News
 607 - Thermal-Tec Inc.
 815 - Tippet Equipment Inc.
 914, 915 - U.S. Coast Guard
 914, 915 - U.S. Coast Guard Auxiliary
 913 - U.S. Coast Guard Marine Safety Office
 914, 915 - U.S. Coast Guard, 17th district
 817 - US Travel
 315 - Wesmar
 109 - West Coast Propeller Service
 819 - Wild Iris Enterprise/Island Foam
 615, 617 - Yaquina Basin Marine Trades Assoc.
 319 - ZF Industries

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Seattle, WA 98115

March 31, 1993

F/NW01:LAB

Legislative Library of Juneau
130 Seward Street, Suite 400
Juneau, Ak 99801

To Whom It May Concern:

I would appreciate copies of the reports listed below that were mentioned in the Legislative Review of the Alaska Salmon Enhancement Program.

Draft Chapter 1X-Economics (January 1993) page 1.

- ✓ (Collie, 1992)
- ✓ (Herrman and Greenberg, 1992)
- (Boyce, 1992)
- (Enhancement Production Cost Analysis-FRED)
- ✓ (Herrman; Bischark, and Greenberg, 1992)

Attachment Chapter XI-Section E.

The Scope, Importance, of Economic Value of the Fishery Enhancement Program to the Recreational Fishery in Alaska-February 1992.

- ✓ P.1-(Jones and Stokes 1991)
- ✓ P.9-(Jones and Stokes 1987, 1989, and 1991)

For your use I have enclosed a copy of the recently published NMFS report: World Salmon Culture and a list of working papers by Oregon State University and the University of Rhode Island economists. Many of these papers address the international demand for salmon.

Sincerely,

Steve Freese, Ph.D
International Trade Specialist

Enclosures

*sent
7/26/93*



URI/OSU RESEARCH PAPER SERIES

- Wessells, Cathy Roheim and James L. Anderson. 1992. *Innovations and Progress in Seafood Demand and Market Analysis*. URI/OSU Research Paper Series, Report #RI-92-101. Department of Resource Economics, Kingston, RI 02881.
- Anderson, Joan Gray and Cathy Roheim Wessells. 1992. *Consumer Ability to Discern Seafood Quality: Results of Experimental Studies*. URI/OSU Research Paper Series, Report #RI-92-102. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and Joan Gray Anderson. 1992. *Seafood Safety Assurances: Implications for Seafood Marketing and International Trade*. URI/OSU Research Paper Series, Report #RI-92-103. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1992. *State-Space Forecasting Approach to Optimal Intertemporal Hedging*. URI/OSU Research Paper Series, Report #RI-92-104. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1992. *Cross-Hedging Fishmeal with Soybean Meal Futures*. URI/OSU Research Paper Series, Report #RI-92-105. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and James E. Wilen. 1992. *Seasonal Patterns and Regional Preferences in Japanese Household Demand for Seafood*. URI/OSU Research Paper Series, Report #RI-92-106. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and James E. Wilen. 1992. *Economic Analysis of Japanese Household Demand for Salmon*. URI/OSU Research Paper Series, Report #RI-92-107. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and James E. Wilen. 1992. *Inventory Dissipation in the Japanese Wholesale Salmon Market*. URI/OSU Research Paper Series, Report #RI-92-108. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1992. *Price Forecasting with State-Space Model of Nonstationary Time Series: Case of the Japanese Salmon Market*. URI/OSU Research Paper Series, Report #RI-92-109. Department of Resource Economics, Kingston, RI 02881.
- James L. Anderson and Sofia U. Bettencourt. 1992. *A Conjoint Approach to Model Product Preferences: The New England Market for Fresh and Frozen Salmon*. URI/OSU Research Paper Series, Report #RI-92-110. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1993. *An Adaptive Model of Perishable Inventory Dissipation in a Nonstationary Price Environment*. URI/OSU Research Paper Series, Report #RI-93-101. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and Joan Gray Anderson. 1993. *Consumer Willingness to Pay for Seafood Safety Assurances: Implications for Seafood Labeling and Public Policy*. URI/OSU Research Paper Series, Report #RI-93-102. Department of Resource Economics, Kingston, RI 02881.

Additional URI/OSU Research Papers

Emami, Ali, Lewis E. Queirolo, and Richard S. Johnston. 1993. Monopsony, Trade Restrictions, and Trade Reversal in International Markets for Intermediate Seafood Products: The United States-Canada Herring Dispute. URI/OSU Research Paper Series Report# OSU-93-102. Department of Resource Economics, Corvallis, OR. 97331-3601.

Johnston, Richard S., and Douglas M. Larson. 1993. Seafood Consumption and Giffen Behavior. URI/OSU Research Paper Series, Report #OSU-93-101. Department of Resource Economics, Corvallis, OR 97331-3601.

Other Papers

Bockstael, Nancy E., Ivan E. Strand, and Douglas Wilipon. 1992. Pulsed Generic Advertising: The Case of Common Property. Marine Resource Economics, Vol. 7, pp. 1889-208

Fleury, Eric. 1993. European Markets for Surimi Products. U.S. Mission to EC-Brussels, Mimeo.

Knapp, Gunnar, Paul Peyton, and Craig Wiese. 1993. The Japanese Salmon Market: An Introduction for Alaskans. Alaska Department of Commerce and Economic Development, Division of Economic Development.

Nerlove Marc. 1993(Feb). Procreation, Fishing and Hunting. American Journal of Agricultural Economics, Vol 75, No.1, p.58

DeVoretz, Don. J. and Kjell G. Salvanes. 1993(Feb) Market Structure for Farmed Salmon. American Journal of Agricultural Economics. Vol 75, No.1, p.227.

Edwards, Steven. 1992. Evidence of Structural Change in Preferences for Seafood. NOAA Technical Memorandum NMFS-F/NEC-87. NMFS Northeast Fisheries Science Center, Woods Hole, Mass. 02543



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Ms. Molly McCammon
P.O. Box V
State Capitol
Juneau, Alaska 99811

April 9, 1993

Dear Ms. McCammon,

Please send me a copy of the Stae Senate Special Committee's report,
Alaska Salmon Enhancement Program; Cost Benefit Study.

Thank You,

Philip G. McCrudden

sent 7/26/93

FISHERIES RESEARCH & CONSULTING

MEMORANDUM**DRAFT****STATE OF ALASKA**
Department of Fish and Game**TO:** Jeffrey P. Koenings
Director**DATE:** May 23, 1991**FILE NO:****THRU:** J. S. Holland
Assistant Director**TELEPHONE NO:** 465-4160**SUBJECT:** Request for Economic
Information from the
Board of Fisheries**FROM:** Jeff Hartman
Economist
Division of FRED

During a May 1991 meeting with Deborah Lyons of the Alaska Board of Fisheries, a specific request was made to supply the board with economic information on the findings of recent economic studies for salmon that would aid the board in their deliberations. In a subsequent meeting of the Alaska State Legislature, similar questions were raised; in particular, some of the economic questions raised at the meetings included:

- What effect have catches of salmon from the enhancement program had on market prices received by fishermen and processors?
- What effect would planned increases from this program have on future prices, particularly pink salmon prices?
- What effect would large harvests of pink salmon have on processing capacity? Could processing industry fail to supply sufficient processing capacity over the long run?
- What effects would this have on market prices?
- Since pink salmon fall in the category of lower-priced species, would increases in harvests of the lower-priced species effect the quality image of other Alaska salmon?
- Would consumers pay less for other Alaska salmon because more of the lower-priced species appeared on the market?

I have compiled a simple primer for Ms. Lyons that will be attached with other materials that are intended as background information for the board. With your approval, I would like to transmit this packet of information through Laird Jones, Executive Director of the Division of Boards.

Attachments

cc: Bob Burkett

DRAFT

**PRIMER ON SALMON PRICE-FORECASTING MODELS AND
COST/BENEFIT ANALYSIS OF ENHANCEMENT
FOR MANAGERS AND POLICYMAKERS**

by

Jeff Hartman
Economist

Alaska Department of Fish and Game
Fisheries Rehabilitation, Enhancement
and Development Division

P.O. Box 3-2000
Juneau, AK 99802-2000

May 1991

INTRODUCTION

At the end of the 1991 legislative session, the Alaska State Legislature and the Alaska Board of Fisheries (BOF) initiated a review of the statewide salmon enhancement program. As part of the review, the policymakers developed a series of socioeconomic questions on the performance of the statewide fisheries enhancement program. The purpose of this primer is to outline the economic questions, explain which economic methods would be appropriate for addressing the questions, provide a history of relevant studies on the subject, provide a basic primer on the theory and methods that are used to estimate demand for Alaska salmon, and propose further work that would specifically address the questions of the BOF and Legislature.

The questions brought up by the BOF and Legislature include:

1. What effect have catches of salmon from the enhancement program had on market prices received by fishermen and processors?
2. What effect would planned increases from this program have on future prices, particularly on pink salmon prices?
3. What effect have large harvests of pink salmon had on processing capacity?
4. Could the processing industry fail to supply sufficient processing capacity over the long run? What effects would this have on market prices and revenue generated from Alaska's fisheries?
5. Since pink salmon fall in the category of a lower-priced salmon species, would increases in harvests of the lower-priced species effect the quality image of other Alaska salmon?
6. Would consumers pay less for other species of Alaska salmon because more of the lower-priced species appeared on the market?

Many of these questions can be addressed through the application of econometric models designed to explain how salmon markets work. The Alaska Department of Fish and Game (ADF&G), Fisheries Rehabilitation, Enhancement and Development (FRED) Division has been very interested in these questions over the last decade. Three separate salmon demand models (described in this text) and a cost/benefit analysis have been developed in the last 8 years to address these issues. Some conclusive results have been produced from these studies that are germane to the policymakers' questions.

WHAT IS A PRICE-FORECASTING MODEL?

Market prices for many goods can be estimated by applying statistical procedures commonly used by economists. Applied to the appropriate data, these procedures can be used to create mathematical models called demand models, which may, among other purposes, be used to forecast prices and explain how markets work. In this paper, demand models are referred to as price-forecasting models. The application of these statistical procedures (a quantitative

area of economics called econometrics) has been particularly successful in the field of agriculture for understanding how food-commodity markets work. These techniques have proven to be successful tools in agriculture because of the stable structure of many food-commodity markets. Some of these price-forecasting models for food commodities, such as grains and meat, have proven to be extremely precise. Typical variables that economists might test in food-commodity models include quantity of the good purchased over time, prices paid at one or more market levels, population growth in various market areas, consumer income, buying power of relevant currencies, and production costs in producing areas.

Forecasting the price of some goods can be extremely complex and not worth the effort. For example, forecasting the future prices for microcomputers might be a difficult task since technology is quickly changing the good itself and the expectations of consumers. Salmon markets may be undergoing some changes; however, evidence of major structural change was only found for chinook salmon in the most current round of demand-modeling studies (Boyce 1990).

WHAT POLICY ANALYSIS CAN BE CONDUCTED WITH SALMON PRICE-FORECASTING STUDIES?

Properly designed price-forecasting studies could provide a wealth of information to policymakers on how markets for Alaska salmon actually work. Some of the major policy analysis that could be addressed with these models include:

- Demand models for salmon can project the amount of change in prices paid to fishermen, processors, and exporters for proposed hatchery production levels.
- Price effects for each species of salmon can be estimated at the Alaska regional level. It is possible to determine how much of a price change would be experienced by fishermen in southeast Alaska by an increase (decrease) in enhanced production in Prince William Sound.
- The studies could predict the amount of price change to Alaska salmon that is caused by existing and planned production of farmed fish.
- Demand models can be combined with cost models for the commercial fisheries as well as with biological population models to determine the net benefits of enhancement investments, loans, or allocation decisions.

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BACKGROUND ON COMPLETED SALMON PRICE-FORECASTING STUDIES FOR ALASKA

1. In 1983, at the request of the Governor's Mini-Cabinet on Fisheries, staff economists from the Commercial Fisheries Entry Commission and the FRED Division developed a formal cost/benefit analysis of the statewide enhancement program. This study included development of basic ex-vessel price models that described how prices for various salmon species would respond to planned production from the state and private nonprofit (PNP) enhancement programs. The study is entitled, "An Analysis of the Net Benefits of Existing and Proposed Enhancement Projects for the State of Alaska."

The final report, which computed the benefits to fishermen, harvesting costs to fishermen, and costs of producing the enhanced fish, was prepared for the Mini-Cabinet on Fisheries (Hartman 1986). An additional investigation and separate delphi study carried out by the Department of Commerce and Economic Development (DCED), Division of Economic Enterprise entitled, "The North Pacific Fisheries Delphi Project," was also undertaken to survey experts in salmon fisheries on the effects of the Alaska's major fisheries enhancement initiative on world markets. Following the completion of these studies, a moratorium on DCED loans resulted in restricted funding to producers of pink salmon. The circumstances in 1983 as well as questions asked were similar to the present, as this action followed a significant decrease in salmon prices. Prices promptly rebounded, despite the moratorium, as exchange rates and other economic trade conditions improved.

2. A second set of studies occurred in 1989 while the FRED Division was investigating the enhancement of sockeye salmon. A formal contract was developed for the Institute of Social and Economic Research to evaluate the price-responsiveness of sockeye salmon to increased Alaskan catches. The name of the study was, "Simple Demand Models for Alaska Sockeye Salmon Prices," by Nick Ronan (1989). The study indicated that catches for sockeye salmon could be increased well beyond the historic highest recorded yield before revenues would be dramatically reduced, and that Alaska was undersupplying sockeye salmon in the market from a revenue-generating perspective.
3. Finally, in 1990 a third and much more comprehensive contract developed ex-vessel level and wholesale-level price-forecasting models for salmon. The study is entitled, "A Comparison of Demand Models for Alaska Salmon" (Boyce 1990). There are conclusive results to this study that are germane to policy questions regarding industry-production levels, because the primary purpose of the study was to identify the variables that effect prices of Alaska salmon, and to determine the amount of influence that our state's output has on ex-vessel and wholesale prices.
4. Further work and revision of the Boyce study is underway in order to update the econometric models. A project proposal is being prepared by the FRED Division

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economist to outline specific economic studies to further improve our understanding of the economic effects of the statewide enhancement program. Some of the model improvements would allow policymakers to understand price impacts in various regions of the state's salmon fisheries, and to incorporate the effects of farmed salmon-production on prices.

STUDY OBJECTIVES FOR THE CURRENT VERSION OF THE 1990 SALMON-DEMAND MODELS

Recently completed studies on salmon demand by the Dr. John Boyce of the University of Alaska-Fairbanks provide some building blocks for further work, but also produce some results that are relevant to current enhancement policy questions. The following points outline the major study objectives for the report, "A Comparison of Demand Models for Alaska Salmon." The goals of the study were intended to accomplish the following:

- Compare the predictive abilities of econometric-demand models for projecting market prices of five species of Pacific salmon against the use of average prices from the previous three years, and a price trend over the same period. Many regional aquaculture associations use average salmon prices to match other production data for estimating cost recovery and enhancement tax revenue for critical fiscal planning. This simple procedure could produce a price estimate that is as precise as any econometric model. This part of the analysis determines whether the econometric models are better or worse predictors.
- Compare the predictive abilities of simple ex-vessel price models with a more complex wholesale system of equation models. Previous salmon-demand research in Alaska has generated two different approaches for estimating salmon prices. The intent of this goal is to determine which of the two approaches produces the most precise price estimates.
- Determine if an increase in the average size of the Alaska salmon pack would increase or decrease total revenues to fishermen. Once the "best" model is determined, the amount of price change that is created by a 20% increase in the size of the catch would be determined.
- Where possible, provide price forecasts for five Pacific salmon species for long-term enhancement planning by projecting all exogenous variables for each of the models. To determine how much revenue would be created in the future by the enhancement program, certain economic variables must be projected, such as exchange rates, income in market areas, supply of salmon in the capture fisheries, and the price of substitutes.

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VARIABLES USED IN THE 1990 SALMON-DEMAND MODELS

The variables tested in the econometric models include the following:

Fresh-Frozen Price
Canned Price
Ex-Vessel Price
Fresh-Frozen Quantity
Canned Quantity
Ex-Vessel Landings
Canned Inventory Holdings from Previous Year
Fresh-Frozen Inventory Holdings from Previous Year
Tuna Price
Real Per Capita Income Average for U.S. and Japan
Sum of U.S. and Japan Populations
Exchange Rate in Yens/Dollar
Real Japanese Short-Term Interest Rates
Real Per Capita Income Averages of U.S. and United Kingdom
Sum of U.S. and United Kingdom Populations
Exchange Rate in Pounds/Dollar
Short-Term Real Interest Rates

MAJOR CONCLUSIONS OF THE SALMON DEMAND-MODELING STUDY

- The econometric models developed in this study predict prices more precisely than than averages of historical prices or price trends.
- The more complex wholesale system of equation models predict prices for chinook coho, and chum salmon more precisely than the ex-vessel models.
- The more complex wholesale system of equation models do not predict as well as the ex-vessel models for pink and sockeye salmon.
- In all models, revenues to Alaska fishermen would increase at higher than 1979 to 1989 mean catches.
- Pink salmon show a higher price response to changes in catch than other species in the ex-vessel models, but prices are unresponsive to changes in catch in more complex wholesale models.
- Amount of price-responsiveness from Alaska output is still difficult to determine for pink salmon; both the ex-vessel model and system-of-equations model have undesirable error statistics. Thus, it is difficult without additional work to draw

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conclusions of how price-responsive pink salmon are to changes in Alaskan harvests. Two of the ex-vessel models tested do show a high level of price-responsiveness, which can be interpreted as a suspicious sign of price-responsiveness.

- For sockeye salmon, price-responsiveness is small, suggesting that this species of salmon is undersupplied from a revenue perspective. The ex-vessel model for sockeye salmon clearly has more desirable error characteristics than the system-of-equations model. It is possible to draw some tentative conclusions about price-responsiveness with this model. The price-responsiveness (an elasticity for the average values of approximately 0.2) values for sockeye salmon are small and, as such, it appears that the supply of sockeye salmon could be increased well beyond the largest catch ever recorded without reducing total revenues to the fisheries.
- The major strength of this model is in determining the amount of price change from U.S. salmon production; the model is weak in "supply-side," which is important for determining the amount of price-responsiveness from production that occurs outside the U.S.

WHAT ADDITIONAL ECONOMIC STUDIES COULD BE UNDERTAKEN TO GAIN A BETTER UNDERSTANDING OF THE STATEWIDE ENHANCEMENT PROGRAM?

Many of the questions asked by legislators and BOF members could be addressed if price modeling were combined with cost models of the fisheries and hatchery programs to conduct a cost/benefit analysis of the statewide hatchery program. A cost/benefit analysis would consist of four components: (1) a hatchery-production model, (2) a population-growth model that reacted to fishing pressure, (3) a demand model, and (4) a fishing-cost model.

Hatchery Production Model for PNP and State Hatcheries

It is necessary to determine the costs of producing the increment in enhanced production. This could either be conducted by evaluating historical production costs and creating a model that would be used for estimating alternative production levels (called a production function), or by going to private producers with a survey and estimating production costs for several years into the future. In the Fisheries Mini-Cabinet study, a survey was used that asked producers to project future costs of production. A survey in this application would probably be the best mechanism for developing cost projections.

Biological-Population Model

Because salmon produced by hatcheries must compete for the same food, are exposed to the same predators, and are exploited in the same fisheries, hatchery populations cannot be considered independent of wild populations.

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A formal population model could be developed for that would describe interactions in fisheries of greatest interest. There are too many projects and stocks of salmon to formally consider interactions in the entire program and, as such, it makes sense to model these interactions in Prince William Sound only. A population model along the same lines as the Queen Charlotte Islands will be developed to estimate probable interactions.

Salmon-Demand Model Improvements

Several potential improvements could be made in the demand models that are currently in place for the salmon enhancement program. One improvement is in the ability to estimate prices for salmon and price-responsiveness on a regional level. A second is the ability to estimate the amount of price change in Alaskan markets for a given increase (or decrease) in farmed salmon production. To accomplish these improvements, it would be necessary to (1) identify the linkages between Alaskan wholesale markets and export markets as the product leaves the U.S., and (2) develop new (CFEC) fish-ticket data reports that stratify price by region.

Cost-Model Improvements

Fishermen use capital and labor in the process of catching fish. Accounting for these costs is an important step in a cost/benefit analysis of a fisheries enhancement project. The amount of additional costs required to harvest enhanced fish is difficult to compute because individual fishing businesses do not produce a formal record of their expenditures. There is a formal record of fishing behavior recorded in the State of Alaska fish-ticket file. This information could be used to develop a model of fishing costs.

Simulation of Net Benefits for Policy Questions

Once the economic models are completed, they are combined so that the benefits and costs of the enhancement program can be estimated. The combined models may estimate prices, costs, and future harvest levels simultaneously in that variables in the demand model may depend on other variables in the cost-and-production models. Conversely some variables in the cost models may depend on variables in the price-and-production models.

Specific policy questions that would be estimated with the models include:

- What would the net benefits be for the current permitted capacity of all PNP hatcheries?
- What net benefits would accrue from a 10% increase in the permitted capacity?
- What net benefits would accrue from PNP operator projections of requested capacities five years from now (1996)?

**PARTIALLY ANNOTATED REFERENCE LIST
OF MATERIALS RELEVANT TO THE LEGISLATURE
AND BOF REVIEW OF THE FRED DIVISION
AND STATEWIDE ENHANCEMENT PROGRAM**

by

Jeff Hartman
Economist
Alaska Department of Fish and Game
Fisheries Rehabilitation, Enhancement
and Development

Studies and Models on Salmon Demand and Enhancement Cost-Benefit Analysis

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- Lin, B. H., M. Herrmann, T. Y. Lin, and R. C. Mittelhammer. 1989. Future price of farmed Atlantic salmon. Presented at the American Agricultural Economics Association Annual Meeting, 30 July-2 August, Baton Rouge, Louisiana.
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UNIVERSITY OF ALASKA FAIRBANKS

School of Management

Fairbanks, Alaska 99775-1070

DATE: Nov 4, 1991

TO: Ginny Fay

FROM: Mark L. Herrmann *MLH*
Department of Economics

Re: Salmon Demand Proposal

I am again happy to have the opportunity to respond to the RSA/RFP for the Salmon Demand Modelling that the Alaska State legislature desires to see performed. Because of my background and continuing interest in this area of study I believe that Josh Greenberg and I have a high probability of success in this endeavor. This proposal will attempt to meet as many of the demands laid forth in the October 3rd request as possible. I believe that this area is vital to the examination of salmon enhancement questions and I look forward to making a positive contribution.

This following proposal will liberally reference the work that I co-authored with Ron Mittelhammer and Bing-Hwan Lin entitled, "An Economic Analysis of the Pacific Salmon Industry: Effects of Salmon Farming -- Final Report". I would be grateful if you could supply interested parties with this work.

I am also pleased that the legislature will consider the extension of the original time deadline for the completed work. I believe that the additional time will be well rewarded. Although some useful information will be forthcoming in a relatively short period of time, the extension will allow for the type of quality work that is necessary to answer some of the complex issues that you have raised.

Thank you for considering us for this project. I hope we can embark on a mutually beneficial relationship in examining this important topic.

cc. John Boyce
Keith Criddle
Joshua Greenberg
John Lehman

An International Supply and Demand Equilibrium
Model for Alaskan Salmon

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This grant proposal is for the purposes of the Salmon Enhancement Project and may not be quoted elsewhere without the permission of the authors.

INTRODUCTION

TITLE: An International Supply and Demand Equilibrium Model for Alaskan Salmon

Salmon is the highest valued commercially caught fish species in the United States (the largest salmon-producing nation) having an exvessel in value in 1990 of 612 million dollars which accounted for over 17 percent of the total U.S. seafood catch value. Alaska is the largest U.S. fishing region for salmon, accounting for approximately 90 percent of the U.S. catch during the last decade. Recent numbers of wild caught salmon in Alaska have been outstanding. The 1990 estimated harvest of 152.7 million salmon was the second highest harvest in Alaska history. However, salmon prices have recently been at low levels in real terms. This has caused friction in the Alaskan salmon industry as documented by the pink salmon dump and the early Bristol Bay sockeye strike. One hypothesized reason for the low prices is the influx of salmon from farming nations as well as the increased wild production.

Approximately 29 percent of the salmon produced in 1990 came from pen-reared salmon production, with an average of 80 percent of this being the highly-regarded Atlantic salmon species. The U.S. is concerned with its dwindling market shares of salmon consumed at home and abroad. For example, in 1980 virtually all of the salmon exported to the EEC originates in North America (Canada and the United States), but now the majority of salmon consumed in the EEC originated from salmon farms in Norway and the United Kingdom. In Japan, the largest salmon-consuming nation in the world, farmed salmon imports from the leading farming nation of Norway have increased 600 percent from 1986 to 1990. Even in the United States, increasing imports of Norwegian, Chilean, and British Columbian farmed salmon has meant that 50 percent of U.S. salmon consumption now comes from imported salmon.

With the pressures of increasing wild and farmed supplies, in combination with the sensitivity of salmon prices to fluctuating exchange rates and other exogenous factors, it is very timely to examine the factors that influence Alaskan salmon prices.

Although many factors that affect salmon prices are outside of Alaskan control, the issue of salmon enhancement is not. A cost/benefit analysis of the Alaskan salmon enhancement programs is needed to examine both the question of total output and the question of the mix of output by species.

This study is not only useful for the salmon enhancement program but is also useful for the U.S. salmon producers, processors, wholesalers, exporters, and government officials in order for them to make investment, production, marketing, and policy decisions.

PROJECT OBJECTIVES

The specific objectives of this project are:

- 1) To update the existing international econometric salmon model as published in a work by Mittelhammer, Herrmann, and Lin for the National Marine Fisheries Service entitled *An Economic Analysis of World Salmon Markets: Effects of Salmon Farming*, with 1989 and 1990 data added (and possibly 1991). Quarterly variables would again be used (Also see Herrmann 1990).

2) To examine the possibilities of changing the functional form of the relevant equations in the above models to linear (or log-linear) instead of double-log to allow for changing elasticities along the demand curve.

3) To disaggregate the salmon species into chinook, sockeye, chum, pink, and farmed Atlantic salmon. An effort will also be made for coho salmon but coho salmon was not separated out in U.S. export statistics until 1986 and may not be possible to model successfully. If coho salmon cannot be modelled successfully as an internationally traded commodity, an approach similar to Boyce's, "A comparison of Demand Models for Alaska Salmon" will be undertaken for coho salmon alone.

4) To expand the model to include canned pink salmon and, if possible, canned chum and/or sockeye.

5) From the existing model to separate out Canada and the U.S. as separate salmon producing regions.

6) To report all relevant own-price cross-price and income elasticities. Cross-price elasticities will be between relevant Pacific and farmed salmon species.

7) To do this modelling at the exvessel and export levels. If the data looked reasonable, the wholesale level would also be modelled. At the very least the factors affecting the wholesale level would be included in the reduced form exvessel price equations.

8) To perform sensitivity analyses over the historical time period to validate the models and to answer questions as to the effects of Cases 1-9 and 11 over the historical time period. Case 10 would be examined if the coho salmon demand could be modelled successfully. Sensitivity analysis would also be done on various market factors such as changing exchange rates, tariff rates, income levels, etc. This sensitivity analysis may be performed independently of the entire demand, cost, and biological model, or may be done exclusively as a part of the final integrations of the three models.

9) To relate the aggregate North American price of salmon to the regional prices of salmon in Alaska through correlation analysis in an attempt to locate regional price changes.

10) To predict Alaskan salmon prices for as long as the model seems reliable. These predictions would be made on assumed levels of market variables and also would be presented with sensitivity analysis.

11) Cases 1-9 and 11 would then be examined in regard to the effect on future prices.

12) To program the past and future simulation programs into SAS and document it for easy use.

13) To write a final report as specified by the RSA/RFP.

I cannot promise the successful modelling of all the areas that the RSA/RSP asks for. However, I believe that Greenberg and I can make as good of an effort to meet as much of the specific objectives outlined in the RSP as any researchers can. We will start the

modelling effort by emphasizing sockeye and pink salmon and build it, step-by-step, from there.

PROJECT PLAN AND MILESTONE CHART

The model already constructed by Herrmann (1990) would be utilized. This model is summarized in Mittelhamer et. al. (1990) on pages 78 - 111. Price linkages here will include exvessel prices, import/export prices, and a proxy for wholesale prices. The equations from 1982 to 1988 will be expanded to further disintegration by species, countries, and by examining the functional form to allow variation in elasticities as supplies change. The expanded model will include data through 1991. This model is an international econometric supply and demand model that models the world shown in the figure below.

The Milestone chart is included at the end of this proposal.

We will model directly all of the variables that we can. Some variables, such as the supply of Chilean farmed salmon to Japan, may be modelled indirectly.

The following are *possible* equations that would be modelled (all salmon here is fresh/frozen unless otherwise mentioned).

1. Norwegian allocation of farm-raised Atlantic salmon

- Quantity allocated to the EEC
- Quantity allocated to the United States

2. EEC demand for salmon

- Quantity demanded of Scottish and Norwegian farmed Atlantic salmon
- Quantity demanded of North American chinook salmon
- Quantity demanded of North American sockeye salmon
- Quantity demanded of North American chum salmon
- Quantity demanded of North American pink salmon
- Quantity demanded of relevant North American canned salmon

3. Japanese demand for salmon

- Quantity demanded of North American chinook salmon
- Quantity demanded of North American sockeye salmon
- Quantity demanded of North American chum salmon
- Quantity demanded of North American pink salmon
- Quantity demanded of Norwegian farmed Atlantic salmon

4. North American allocation of chinook salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

5. North American allocation of sockeye salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

6. North American allocation of chum salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

7. North American allocation of pink salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

8. North American allocation of chinook salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

9. North American demand

- Quantity demanded of Norwegian farmed Atlantic salmon

10. North American inventory holdings

- Quantity of chinook salmon inventory
- Quantity of sockeye salmon inventory
- Quantity of chum salmon inventory
- Quantity of pink salmon inventory
- Quantity of pink canned salmon inventory

11. North American exvessel prices

- Price of chinook salmon
- Price of chum salmon
- Price of sockeye salmon
- Price of pink salmon

12. Exvessel Regional Mappings

- The exvessel prices of species and regions in Alaska as the FRED division or other interested parties wish.

Bloc 1 above will model the allocation of a given supply of Norwegian salmon to the U.S., Japan, and the EEC. Because of the nature of the allocation set-up, only two of the equations are estimated and the third can be derived from these two. The Norwegian allocation equations will be modelled as if Norway exhibited market power and in regard to the newly placed U.S. tariffs on Norwegian Atlantic salmon imports which will enter through the U.S. demand equation as in Herrmann (1991a).

Blocs 2 and 3 will include equations for the demand in the EEC and Japan for as many of the species as can be estimated directly. Blocs 4-8 will be the allocation equations for wild Pacific and farmed Atlantic salmon into either the EEC or Japan. Once again the allocation of Pacific salmon into either the domestic market or the inventory holdings can be derived from here. Bloc 9 will be the U.S demand for farmed Norwegian Atlantic salmon. Missing is the U.S. demand for its own salmon. I have not been successful at getting these demand equations at the wholesale level when the data is used on a quarterly basis. Data must be used either on a quarterly or monthly basis to get enough observations since salmon export data is not disaggregated by species until 1981 and, in any case, farmed salmon is not important until this same period. Nevertheless, not much information for simulation or prediction purposes is lost as any factors affecting wholesale demand can be included in the exvessel equations (see Mittelhammer et. al. pages 108 to 112).

Bloc 10 includes the inventory equations. These equations are crucial to successfully model the world flows of salmon. Japanese inventories are also included although not modelled specifically. It may be possible to model the Japanese inventory equations directly, but we do not guarantee success. In the Japanese model, the recently completed research of Cathy Wessels of the University of Rhode Island and Jim Wilen of the University of California at Davis will be used to fine tune model specification.

Bloc 11 is the exvessel price equations. All international movement will link directly or indirectly back into these equations for sensitivity and prediction purposes (see Mittelhammer et. al. pages 108 to 112).

Bloc 12 will be the correlation of the U.S. exvessel prices with regional Alaskan exvessel prices. For example, we will take actual U.S. sockeye prices and correlate the movement of Bristol Bay reds to U.S. sockeye prices. We would expect this correlation to be high. Then we would use predicted U.S. sockeye prices to predict Bristol Bay sockeye prices.

Because of space considerations I cannot list all the variables that I will be using in each equation (please see Mittelhammer et. al. pages 64 to 72 to give you an indication of the types of variables that I work with).

I also cannot specifically tell you which functional forms that I will use. I will be looking at a combination of the double log, log-linear, exponential, Box-Cox, Logit, among other functional forms. I will choose the functional forms that fit best to theory, fit best to what we are trying to model, and fit best for each individual equation. These functional forms may likely include lagged endogenous variables in the equations to pick up habit formation.

Sensitivity analysis will be performed from the final model to estimate how well the model predicts past prices from the sample data. The usual econometric goodness of fit statistics will be used. Additionally the weighted goodness of fit statistics developed by Herrmann (see Mittelhammer et. al. pages 46 to 50) for the proofs of these methods. Sensitivity analysis, over the historical time periods, will be used to capture the movements of market factors on the quantity and prices of salmon (please see as an example of this Mittelhammer et. al., pages 118 to 192). These sensitivity analyses will include looking at the movement in North American exvessel prices and correlating them with regional exvessel prices such as the prices listed in the October 28, 1991 memo from Ginny Fay. Analysis over the historical time period can then be made as to what effects historical changes in hatchery management would have made on changes in fisheries revenues. Cases 1-9 and 11 will be examined if the modelling of the four Pacific salmon species were successful to this point.

Prices will then be predicted at the exvessel level. These predictions will be on a quarterly basis but will be reported as weighted average prices on an annual basis. The same sensitivity analysis that will be performed over the historical time period will also be performed on future prices, i.e. cases 1-9, and 11. (for an example of predictions and sensitivity analysis see Mittelhammer et. al. pages 196 - 213).

These predicted prices will then be mapped into regional Alaskan prices to get at regional differences. Marginal revenues can then be figured out per region and fishery by multiplying the predicted regional price by the catch.

DATA

A list of all the variables that we will need is too long for this proposal. Please see Mittelhammer et. al. for previous variables that I have used.

Data requirements will be extensive. I cannot list all of the requirements until we are into the modelling effort. Here is some information about the data that I feel is needed for a realistic and comprehensive salmon market study. The reasons that the data requirements are quite large is that, in my opinion, any realistic modelling of salmon markets must take into account the truly global nature of both the supply of and the demand for salmon. Omitting countries such as Japan, which is the largest salmon consumer in the world, will seriously bias any modelling effort. The same is true for any deletion of farm supply countries. I will rely on the trip taken by the Salmon Task Force to Japan to further add information that will be used in the Japanese salmon demand model. I anticipate working closely with Chuck Weiss in this area.

The immediate collection of this data will **greatly** facilitate a timely salmon market study. In fact it is imperative. In general, the data requirements for the following are monthly.

Export/Import Statistics in General

All I/E stats I need should be by species by **month** by country (quantities and value). For the United States, I have previously collected these statistics from NMFS through Joe Terry. He had all the U.S. I/E data on tape. If possible, I would like to get this data from the same Seattle branch of NMFS. Getting the data on tape obviously is the preferred method. The data is published on microfiche by the Department of Commerce, but it is usually about 18 months behind (at least the last time I looked). I do not need (or necessarily want) these statistics broken out by intra-country regions. I would be too hard to aggregate in a short period of time.

Import Statistics (U.S. and Japan)

I need U.S. imports of both fresh and frozen salmon from 1989 on. I have heard that there is an individual, Bill Aberly, who has this (and maybe more?) info at the Center for International Business at the University of Alaska Anchorage.

For the Japanese imports statistics I need imports of fresh and frozen salmon from 1989 on. I do **not** need canned imports.

Optional -- It would be nice to have the Canadian Imports from 1982 on. I have not looked into this. I believe that for both the E/I stats from Canada that you now must go through the Canadian Government E/I statistics located in Tronto. I do not remember offhand the Gov Agency that you have to contact but you can call Bing-Hwan Lin at (202) 219-0459. He is the one that ordered the data in the past.

Export Statistics (United States, Canada, Chile).

I need all species available for the U.S. of frozen and canned salmon. The U.S. has export stats of all 5 species plus "other" of frozen salmon (which I need). They also have

exports of canned sockeye, chum, and pink salmon. (see U.S. imports for reference). I need these from 1989 on.

I need Canadian exports for fresh chinook and coho, frozen chinook, coho, sockeye, and chum, and canned exports of pink, chum, and sockeye. I need these from 1989 on.

For Chile, **if possible**, I need exports statistics for their salmon. I am not sure how to get them or what form they are in. I believe that there are exports statistics available by frozen and fresh form (which is all I need). I think you can contact *Fundacion Chile*. The director of *Fundacion Chile* is Carlos Turmann Tel. +56-2-228-1446 or a direct line at +56-2-228-5920. I would like these from 1982 on.

Inventories

Frozen and Salted (U.S. (just frozen) and Japan (both))

I need up to date U.S. frozen inventories. I have been getting these from John Bishop at the Stats department of NMFS in Seattle. I need the estimates for 1991 on.

I have the Canadian frozen inventories. I should have most of these but I may have some holes from 1988-1990. Larry Neilson of the Ministry of Agriculture and Food in Victoria, Canada, handles this.

I need the frozen and salted inventories from Japan. These are broken out into all salmon excluding pink and pink. I need these from 1989 on. I have been purchasing this data from Clint Atkinson in Seattle.

Canned (U.S. and Canada)

I need the U.S. inventories, which are available from the National Food Processors Association in Wa. DC. I believe that you can get these through Seattle from Joyce Dunn (206) 323-3540 for all species of salmon, from 1989 on.

I would **love** to get my hands on Canadian canned inventories. I tried many times in vain to get this from Ilene Casely of the Fisheries Council of British Columbia. Apparently, they consider this too confidential to release.

Landings and exvessel prices

Needed are monthly landings from CA, AK, and BC.

From Ca, I needed the Review of fisheries for 1989, 1990 from the Pacific Fishery Management Council in Portland Oregon.

I need Alaskan landings and exvessel prices from 1982 on. It would be best to get **both** the quantities and prices from CFEC (I believe) and back to 1982 to make sure the data set is consistent. I would like to have these by species **and to include salmon roe** as

- 1) total for all of Alaska, by species, but aggregated across gear types and areas;
- 2) by region and species, but aggregated across all gear types; and

3) by region, species, and by gear type.

I need the B.C. stats from 1989 on. These come from DFO, Vancouver, Canada.

I also need annual CFEC exvessel prices by regions for the last 15 years or so along with landings.

Farmed Supplies

Basically here I will take anything I can get. Important countries are U.S., Canada, Chile, Japan, Scotland, and Ireland. If these are not available monthly I can use annual reports. I have most of the annual reports through 1989 or 1990.

Japanese Wholesale Fish Prices

These are tougher to get. I have been using a price series that Bing-Hwan Lin collected in Japan. I may switch to a wholesale monthly price that is for 6 major markets in Japan. I believe that Clint Atkinson in Seattle has these. We may need to contact Clint very quickly. I believe he is leaving soon for a trip to Japan. I also have been using CPI and a food expenditure list that Bing collected. Again, there are other sources for these and Clint may have them.

Fish Tickets

Fish Tickets would be **extremely** helpful. It would be nice to have them from, say, 1980 on. I have been working with Josh Greenberg with King and Tanner crab fish tickets and we have the computer programs set up to transform the data in the form that we require. It would be helpful to have these for all areas. I have done a great deal of past work with salmon fish ticket data looking at fleet characteristics. We have used this knowledge to model the cost/benefits of pot limit restrictions for the King crab fishery in Bristol Bay. I believe that additional important policy issues could be addressed with the integration of the salmon fish ticket data and the salmon permit values.

Other

Jeff Hartman mentioned that CFEC had annual estimated wholesale prices. It would be helpful to have these. Any other information such as estimated annual consumption or anything else would be very useful. It would also be nice to get monthly permit values from 1980 on for all areas and gear types.

Also, I have an idea for the modelling of canned salmon. I was talking to Chuck Crapo about the canned salmon industry. He said that until 1986 canned salmon was supported by the sale of the roe to Japan but that these sales no longer will cover all the expense of canned salmon. It would, therefore, be nice to get the U.S. exports of salmon roe from 1982-1991 and the Canadian exports of salmon roe. For the future, it would be very interesting when modelling the canned salmon industries to also simultaneously model the roe industries. It may be the case that in Japan as other roe products become cheaper, and as the demand for salmon roe lessens, that it will hurt the U.S. canned salmon industry.

PREDICTIONS

We will predict for as long a period as possible although the longer the prediction period the less accurate we would expect these predictions to be. For successful predictions three things are needed (besides a little luck!). 1) The estimated model must be accurate. 2) The forecasted market factors, such as exchange rates, must be accurate. 3) The structure of the salmon industry that was prevalent when the model existed must continue into the future. Obviously, all three of these conditions will not hold. It is hoped that they will hold to some extent.

Condition 1 comes from the researchers expertise in modeling the salmon markets. Forecasting models are simplified realities that are used for prediction purposes. Some indication of their effectiveness can come from goodness of fit statistics but in reality, the acid test is the initial forecasts. The second condition is much more likely to hold true in the short-run than in the long-run. As factors, such as exchange rates vary, it will make the predictions less likely to be accurate. This model will be written so changes in exogenous factors can be included as they occur to make the model more accurate. The third condition involves the structure of the salmon market. Recently, there have been many structural changes. One advantage of an econometric model is that it can be enriched each year and structural changes can be captured.

PAST RESEARCH BY CO-INVESTIGATORS

Herrmann has made the study of salmon economics the focal point of his career, having published or delivered 35 papers, journal articles, or other types of publications on various topics dealing with salmon economics. Herrmann has focused most of his work on the world salmon markets building an international supply and demand model for wild and farmed salmon. In these studies, Herrmann has used the latest developments in econometric estimation, demand systems, international modelling, and seasonality issues. Herrmann and Lin (1988) developed a simultaneous supply and demand model in modelling the world trade of Norwegian farmed Atlantic salmon. Lin et al. (1989) used this model to forecast salmon prices to the year 1992. The initial forecasts, using data that ended in 1987, was for a \$0.98 drop in U.S. Atlantic salmon prices by the beginning of 1989. These forecasts were very accurate, being only 5 cents off in the first quarter of 1989. Herrmann et. al. (1991b) used, for the first time, Almon-Type polynomials to model the seasonality of the Japanese demand for salmon which allowed the demand elasticities to vary by month. In Herrmann (1990) and Herrmann et. al. (1991), the international supply and demand model for salmon, which included every commercially important species of wild salmon in the United States, Canada, the EEC, Japan, and Chile, was presented. The estimation technique used here was developed by Herrmann and Mittelhammer and called the Bayesian Bootstrapping Two-Stage Least-Squares estimation technique. This technique combined sample data with expert knowledge of the salmon industry to estimate parameter values. Various parts of salmon demand were also subjects of more direct focus such as, for example, Herrmann et al. (1991a) estimated the impact of a new 12 percent tariff placed on U.S. imports of Norwegian salmon by the U.S. government and Lin et. al. (1990) focused on the effects of exchange rates on salmon prices. Most of these works were the result of a S-K Grant from NMFS.

In addition to the above publications, Herrmann has international and statewide recognition in the area of salmon modelling. This exposure is crucial in making

contacts, gaining access to foreign data, and building a reliable reputation. Herrmann has delivered papers in Canada, Denmark, Puerto Rico, and is slated to deliver three papers with Greenberg at the International Institute of Fisheries Economics and Trade meetings next summer in France. This year Herrmann delivered a paper at the Southwest Alaskan Municipal conference in Kodiak, gave public testimony before the Pacific Fisheries Legislative Task Force in Kenai, and talked about his research at the Fisheries Symposium in Anchorage.

Joshua Greenberg brings to this study an excellent understanding of the Japanese fisheries markets as well as vast experience in fisheries marketing models from his work in the King crab fisheries. He is also knowledgeable about Alaskan issues from his previous work with the experiment station at the University of Alaska Fairbanks in which he worked extensively with native Alaskans in reindeer studies. Specifically, Greenberg et al. (1991) estimated a bioeconomic model for king crab fisheries where Japan was modelled as the most important fishery for King crab. In Greenberg et al. (1990) the reindeer range in Alaska was modelled which looked extensively at native Alaskan issues.

Herrmann and Greenberg have a long and fruitful working relationship. They have been working closely together since 1985 when they were graduate students together at Washington State University. They are currently co-principle investigators on a ADF&G grant examining various ways to increase industry rents for the King and Tanner crab fisheries in the Bering Sea and Aleutian Islands. The issues they are examining are how rents for King and Tanner crab can be increased through a combination of pot limits, limited entry, adjusted season length, exclusive registration, and/or ITQs keeping in mind that the Magnuson Act may preclude some of these possibilities if there are distributional effects that will unfairly redistribute rents between Alaska and Seattle fishermen. They also have co-authored a proposal to the Alaskan Sea Grant College Program entitled "An Economic Analysis of World Salmon Markets for Wild and Farmed Salmon".

In addition to the working relationship of Greenberg and Herrmann, we will rely on the salmon modelling expertise of John Boyce to further enrich our work. Herrmann and Boyce have a history dating back to their graduate school years at the University of California Davis.

BUDGET JUSTIFICATION AND NEED

To complete this project by December 30, 1991 Josh and Herrmann would need to work for summer wages. The remainder of the money would be used to purchase miscellaneous data. We would work more than the 3.25 months specified with the remainder of the time being donated to the project. Other donations would probably include graduate student hours, data collected for Herrmann's previous model, and any work that would come from an Alaska Sea Grant. In addition, Mittelhammer is contracted for work under the Alaska Sea Grant and could be use for duplicate work on this project without a conflict of interest arising. Mittelhammer's expertise in econometric modelling will be invaluable to this project and all of his time as an advisor will be donated to the project.

Herrmann anticipates spending 33% time on this project until December 15th and then 75% time until the projects completion. This should donate approximately 2.75 months of UAF research time to the project. Greenberg anticipates spending 25% time until

Dec 15th then 40% time until the projects completion. This should lead to Greenberg's donation of UAF research of approximately 2 months to the project.

Salaries:

Mark Herrmann 2 mo. @ \$4,500/mo.	\$9,000
Josh Greenberg 1.25 mo. at \$4,000/mo.	\$5,000
Benefits	\$3,174
Data	\$826
Total	\$18,000

We would like to thank the University of Alaska Fairbanks for waiving the overhead on this project in addition to their funding of independent research. UAF recognizes the importance of this project to the state of Alaska and we are grateful to them.

DEVIATIONS FROM THE ORIGINAL RSA/RSP

The authors have tried to answer as many of the concerns of the original RSA/RSP as possible. Much of the success of the modelling cannot be fully anticipated until it is undertaken. Sometimes necessary simplifications must be performed where the model dictates keeping the original intent of the model and the strive for quality in tact. A few of the places where the modelling may deviate from the RSA/RSP are listed below with the page references referring to the RSA/RFP entitled "Salmon Demand Modeling", and dated October 3, 1991.

Under "Demand Model Requirements" on page 3 it is requested that prices will be predicted for 15 years for all five Pacific salmon species. This may not be possible. It is very difficult to predict for more than a couple of years. Fifteen years ago, if salmon prices had been predicted, the models would not have included farmed salmon. There are just too many structural changes in this amount of time. In addition, using quarterly data as we must do, a fifteen year prediction would be a prediction of 60 time-periods. I doubt that a simulation forecast could turn out 60 time periods. However, this is not to say that useful information pertaining to hatchery enhancement programs cannot be achieved. In the final simulation model which includes all models, sensitivity analysis can be performed which will estimate potential future profits given different levels of market variables, such as exchange rates. I believe that we have the expertise with John Boyce and Diane Bischak, who is a simulation expert, to generate this kind of information.

On page 4 the paragraph which starts with "If possible" asks for the linkages between prices at the exvessel, import, and wholesale levels. I believe that this is possible indirectly even if it is not possible directly. The wholesale demand for Japan, the EEC, and the U.S., may not be possible to model directly because disappearance and price data by species at the wholesale level on a quarterly basis are nearly impossible to accurately estimate. However, the wholesale market variables that affect

wholesale can be included in the exvessel price equations as an indirect determinant with indirect linkages established as was done in previously by Herrmann, Mittelhammer, and Lin (see Mittelhammer et. al. pages 108 to 112). Also, canned wholesale demand may be difficult to model because of the time constraints of the project but may be included indirectly in the U.S. allocation models as was done in the above study on pages 94-98.

Starting on page 4 of the RSA/RSP there are 11 cases that are asked to be examined. Case 10 that deals with coho salmon may be a question mark because of the concerns of coho salmon modelling that are mentioned earlier.

The first paragraph in page 6 states that the regional prices must be econometrically modelled and the influences of one regions prices tested to determine the effects on other region's prices. This will be somewhat difficult since it is very difficult to link the different region's prices. An attempt will be made to correlate these annual regions prices over time but success is uncertain. The successful predictions of regional exvessel prices are much less certain than the success of overall U.S. exvessel prices by species.

I believe that Greenberg and Herrmann, with the help of Boyce and Mittelhammer, are in the best position to model the demand for Alaskan Salmon. But modelling success can never be made with absolute certainty. What can be stated with certainty is the amount of effort that the research team will give the project and that useful information, that will help future enhancement decisions, will be forthcoming.

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- Lin, Bing-Hwan, Mark Herrmann, Tsae-Yun Lin, and Ron C. Mittelhammer. "Forecasting the Price of Farmed Atlantic Salmon: An Integrated Econometric and Time Series Approach." Agribusiness: An International Journal 5(Spring 1989): 477-488.
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VITA'S

Herrmann's and Greenberg's vita's are enclosed below. Greenberg's Vita is incomplete. We will send a more complete one of his later.

PROJECT SCHEDULE AND BUDGET PROJECTION

#'s refer to Pages 1 and 2	PROJECT ACTIVITIES Project Year	1991 Quarter 4	1992 Quarter 1	1992 Quarter 2	1992 Quarter 3	1992 Quarter 4
0	Data Collection & Updated Model	X	X	X	X	X
1	Functional Form work	X	X	X	X	X
2	Disaggregation Work	X	X	X	X	X
3	Canned Solver work	X	X	X	X	X
5	Disaggregation of Countries	X	X	X	X	X
6	Elasticity Estimation	X	X	X	X	X
7	Level estimation (Mkt)	X	X	X	X	X
8	Sensitivity Case Analysis	X	X	X	X	X
9	Regional Correlation	X	X	X	X	X
10	Predictions	X	X	X	X	X
11	11 + Cases	X	X	X	X	X
12	SAS Program	X	X	X	X	X
13	Final Report	X	X	X	X	X
-	Prelim Report	X	X	X	X	X

(Form 90-6)

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EDUCATION

- Ph.D. Agricultural Economics, Washington State University, 1990.
 Dissertation topic: An Economic Analysis of World Salmon Markets:
 Effects of Salmon Farming. Major Advisor: Ron Mittelhammer.
- M.S. Agricultural Economics, University of California at Davis, 1985.
- B.S. Agricultural Economics, University of California at Davis, 1982.

AWARDS

U.S.D.A. Marketing Fellowship, 1985-1988.

EXPERIENCE

- Assistant Professor, Economics Department, University of Alaska Fairbanks,
December, 1990 to present. This is a split research and teaching
appointment. Taught classes in Intermediate Macroeconomics,
Introduction to Statistics for Economics and Business, Principles of
Economics, and International Economics.
- Consultant, R.J. Solie and Associates, January, 1991 to Present. Estimated
damages to Alaskan salmon commercial fishermen from the ExxonValdez oil
spill in Prince William Sound.
- Research Associate, R.J. Solie and Associates, September, 1990 to January, 1991.
Estimated damages to Alaskan salmon commercial fishermen from the
ExxonValdez oil spill in Prince William Sound.
- Consultant, Law Firm of Mudge, Rose, Guthrie, Alexander, and Ferdon, July-
August 1990. Performed research on various topics dealing with a lawsuit
by the Coalition of Fair Atlantic Salmon Trade against the Norwegian
government for allegedly subsidizing and selling its salmon at a price below
fair value.
- Research Assistant, Department of Agricultural Economics, Washington State
University, 1988-1990. Performed research funded by a grant from the
National Marine Fisheries Service. Work involved building an international
econometric equilibrium model for world salmon markets.

Teaching Assistant, Department of Agricultural Economics, Washington State University, Spring 1986. Graded homework and held extensive office hours for a doctorate-level statistics course.

Teaching Assistant, Department of Agricultural Economics, University of California at Davis, 1983-1985. Gave lectures, wrote and graded homework and exams, led discussion sections, and held office hours for six undergraduate classes, which covered topics including microeconomic analysis, linear programming, regional analysis, production economics, and marketing.

Research Assistant, Department of Agricultural Economics, University of California at Davis, 1984. Assisted with a study dealing with the California-Arizona lemon production region and with another dealing with the demand for food stamps in the United States.

Instructor, M.T.I. Western Business College, Sacramento, California, April 1982-August 1983. Had complete responsibilities for teaching courses in bookkeeping, accounting, and business math.

ACADEMIC SERVICE

Journal Referee, *Western Journal of Agricultural Economics*, 1990.

Journal Referee, *Canadian Journal of Agricultural Economics*, 1989.

President, Agricultural Economics Graduate Student Association, Washington State University, 1988-1989.

Graduate Student Representative, Graduate Advisory Committee, Washington State University, 1988-1989.

Graduate Student Representative, Agricultural Economics Library Committee, University of California at Davis, 1984-1985.

PROFESSIONAL MEMBERSHIPS

American Agricultural Economics Association

American Economics Association

Canadian Agricultural Economics and Farm Management Society

International Institute of Fisheries Economics and Trade

Northeastern Agricultural Economics Association

Western Agricultural Economics Association

Western Alaska Salmon Alliance

World Aquaculture Society

RESEARCH GRANTS RECEIVED

Alaska Department of Fish and Game, Commercial Fisheries Division, "Economic Impacts of Alternative Potlimits in the Bering Sea and Aleutian Islands King and Tanner Crab Fisheries." \$24,000 (with J. Greenberg), July, 1991.

University of Alaska Summer Research Faculty Grant, "Economic Impacts of an Alternative Management Policy in the Bering Sea and Aleutian Islands King and Tanner Crab Fisheries." \$5,000, May, 1991.

University of Alaska Faculty Small Grants Program Award, "An Economic Evaluation of the Potential Profitability of Salmon Farming in Alaska." \$5,000, April, 1991.

National Marine Fisheries Service, "An Economic Analysis of the Pacific Salmon Industry: Effects of Salmon Farming." \$102,000 (with R. Mittelhammer and B. H. Lin), February 1988.

Canadian Studies Faculty Research Grant Program, "An Economic Analysis of the World Demand for Atlantic Salmon with an Emphasis on North America." \$5,000 (with B. H. Lin), September 1987.

JOURNAL ARTICLES REFEREED

Herrmann, Mark, Ron C. Mittelhammer, and Bing-Hwan Lin. "World Salmon Markets." *American Journal of Agricultural Economics*, currently under first review.

Herrmann, Mark, Bing-Hwan Lin, and Ron C. Mittelhammer. "The Japanese, European, and North American Demand for Wild and Farmed Salmon." *Canadian Journal of Agricultural Economics*, currently under first review.

Herrmann, Mark, Bing-Hwan Lin, and Ron C. Mittelhammer. "Effects of Countervailing Duty on Norwegian Farmed Salmon." *Agribusiness: An International Journal*, forthcoming in 1991.

Herrmann, Mark, Ron C. Mittelhammer, and Bing-Hwan Lin. "Applying Almon-Type Polynomials in Modelling Seasonality of the Japanese Demand for Salmon." *Marine Resource Economics*, forthcoming in 1991.

Lin, Bing-Hwan, Mark Herrmann, Tsae-Yun Lin, and Ron C. Mittelhammer. "Forecasting the Price of Farmed Atlantic Salmon: An Integrated Econometric and Time Series Approach." *Agribusiness: An International Journal* 5(Spring 1989): 477-488.

Lin, Bing-Hwan, Mark Herrmann, and Ron C. Mittelhammer. "An Economic Analysis of the Pacific Salmon Industry: Effects of Salmon Farming." research note. *Northwest Environmental Journal* 5(Spring/Summer 1989): 160-161.

Herrmann, Mark, and Bing-Hwan Lin. "The Demand and Supply of Norwegian Atlantic Salmon in the United States and the European Community." *Canadian Journal of Agricultural Economics* 36(November 1988): 459-472.

OTHER PUBLICATIONS

- Herrmann, Mark., Ron C. Mittelhammer, and Bing-Hwan Lin. "An International Econometric Model for Wild and Pen-Reared Salmon." Forthcoming as a chapter in *Aquaculture: Models and Economics*. F.J. Upton Hatch and Henry Kinnucin, Westview Press, 1991.
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- Mittelhammer, Ron C., Mark L. Herrmann, and Bing-Hwan Lin. "NMFS Quarterly Reports No. 4, 5, 6, and 7". NMFS Salmon Grant, 1, Jan. 1989, 1 Apr. 1989, 1 Aug. 1989, 1 Oct. 1989.
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- Lin, Bing-Hwan, and Mark Herrmann. *An Econometric Analysis of Atlantic Salmon Markets in the United States and France*. Fairbanks: Alaska Sea Grant, 1988. 88-5.

PROFESSIONAL PAPERS AND PRESENTATIONS

- Herrmann, Mark. "Alaska Sea Grant Involvement in Fisheries Economics: Current Issues and Concerns." Invited Testimony at the Pacific Fisheries Legislation Task Force, Kenai, Alaska, 19-20 September 1991.
- Herrmann, Mark. "The Salmon Price Drop of the 90's: Consumer Gain Alaskan Pain." Invited Presentation presented at the Southwest Alaska Municipal Conference, Kodiak, Alaska, 5-8 September 1991.
- Herrmann, Mark., and Ron C. Mittelhammer. "An International Econometric Model for Wild and Farmed Salmon." Invited Paper presented at the 22nd Annual Meeting of the World Aquaculture Society, San Juan, Puerto Rico, 16-21 June 1991.
- Mittelhammer, Ron C., and Mark L. Herrmann. "How do the Checkbooks Balance? A Review of Some Facts About the Demand and Prices of the Fresh/Frozen Salmon in the United States." Invited Paper presented at the Alaska Fish Conference Exposition, Anchorage, Alaska, 25-28 November 1990.
- Mittelhammer, Ron C., and Mark L. Herrmann. "Additional Comments Concerning the Petition for the Imposition of Antidumping and Countervailing Duties in the Matter of Fresh and Chilled Salmon from Norway." Working paper prepared for the law firm of Mudge, Rose, Guthrie, Alexander, and Ferdon. 2121 K Street, Washington, D.C., 1990.
- Mittelhammer, Ron C., and Mark L. Herrmann. "Evidence on the Substitution Relationship Between Norwegian Farmed Atlantic Salmon and Wild Pacific Salmon." Working paper prepared for the law firm of Mudge, Rose, Guthrie, Alexander, and Ferdon. 2121 K Street, Washington, D.C., 1990.
- Mittelhammer, Ron C., and Mark L. Herrmann. "Factors Affecting the Prices of Norwegian Farmed Atlantic Salmon." Working paper prepared for the law firm of Mudge, Rose, Guthrie, Alexander, and Ferdon. 2121 K Street, Washington, D.C., 1990.
- Herrmann, Mark. "Some Observations on the Demand for Farmed Atlantic Salmon and Effects on North American Commercial Pacific Salmon Fisheries." Invited paper presented at the Aquaculture: Current Issues and Prospects seminar series at Washington State University, Pullman, WA, 11 December 1989.
- Herrmann, Mark, Ron C. Mittelhammer, and Bing-Hwan Lin. "Applying Almon-Type Polynomials in Modelling Seasonality of Demand: The Case of the Japanese Demand for Salmon." Presented at the American Agricultural Economics Association Annual Meeting, Baton Rouge, LA, 30 July-2 August 1989.
- Lin, Bing-Hwan, Mark Herrmann, Tsae-Yun Lin, and Ron C. Mittelhammer. "Future Price of Farmed Atlantic Salmon." Presented at the American Agricultural Economics Association Annual Meeting, Baton Rouge, LA, 30 July-2 August 1989.

Lin, Bing-Hwan, Mark Herrmann, Tsae-Yun Lin, and Ron C. Mittelhammer.
"Forecasting the Price of Farmed Atlantic Salmon." Invited paper presented
at the 64th Annual Western Economics Association International
Conference, Lake Tahoe, CA, 18-22 June 1989.

Lin, Bing-Hwan, Mark Herrmann, Tsae-Yun Lin, and Ron C. Mittelhammer.
"Effects of Exchange Rates and Supply on the Forecasted Price of Farmed
Atlantic Salmon." Invited paper presented at the Salmon Marketing
Workshop at Simon Fraser University, B.C., Canada, 15-19 May 1989.

Lin, Bing-Hwan, Mark Herrmann, Tsae-Yun Lin, and Ron C. Mittelhammer.
"Future Supply and Price of Norwegian Atlantic Salmon." Invited paper
presented at the Aquaculture International Congress, Vancouver, B.C.,
Canada, 6-9 September 1988.

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Atlantic Salmon in the United States and the European Community." Paper
presented at the American Agricultural Economics Association Annual
Meeting, Knoxville, TN, 31 July-3 August 1988.

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Atlantic Salmon in the United States and the European Community." Paper
presented at the Fourth Conference of the International Institute of
Fisheries Economics and Trade, Esbjerg, Denmark, 6-10 August 1988.

Lin, Bing-Hwan, and Mark Herrmann. "An Economic Analysis of Atlantic Salmon
Markets." Paper presented at the Symposium of Markets for Seafood and
Aquaculture Products, Charleston, SC, 16-21 August 1987.

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EDUCATION

Ph.D.: Agricultural Economics, Washington State University, December 1990.

Dissertation Title: An Econometric Analysis of the Alaska King Crab Industry: A Bioeconomic Approach.

M.S.: Resource Economics, University of Alaska Fairbanks, December 1984.

B.S.: Business Administration, University of Connecticut, May 1982.

EXPERIENCE

Assistant Professor of Resource Economics, School of Agriculture and Land Resource Management, University of Alaska Fairbanks. November 1990 - Present.

Economist, National Marine Fisheries Service, and
Research Assistant, Department of Agricultural Economics, Washington State University. August 1986 - July 1990. Development of a bioeconomic model of the Alaska king crab industry.

Research Assistant, Department of Agricultural Economics, Washington State University. August 1985 - July 1986. Assisted in departmental research.

Research Associate, School of Agriculture and Land Resource Management, University of Alaska Fairbanks. September 1984 - August 1985. Research focused on economic aspects of the Alaska reindeer industry.

Research Assistant, School of Agriculture and Land Resource Management, University of Alaska Fairbanks. September 1982 - August 1984.
Developed a model which analyzed the economic performance of alternative reindeer herd management plans.

ACADEMIC SERVICES

W-133, Western Regional Project, "Benefits and Costs in Natural Resource Planning," 1991.

Graduate student representative, Faculty Senate Systems and Computing Committee, Washington State University, 1987-1989.

Natural Resources Committee, Department of Agricultural Economics, Washington State University, 1987-89.

PROFESSIONAL AFFILIATIONS

American Agricultural Economic Association
American Economic Association
Western Agricultural Economic Association
Omicron Delta Epsilon

JOURNAL PUBLICATIONS

Greenberg, Joshua A., Scott C. Matulich and Ron C. Mittlehammer. "A System-of- Equations Approach to Modelling Age-Structured Fish Populations: The Case of Alaskan Red King Crab, Parilithodes camtschaticus." *Canadian Journal of Fisheries and Aquatic Sciences*, 48(9), Sept. 1991: 1613-1622.

Greenberg, Joshua A., Wayne C. Thomas and William G. Workman. "Economic Evaluation of Reindeer Range in Alaska." *Canadian Journal of Agricultural Economics*, 38, March 1990: 89-105.

OTHER PUBLICATIONS AND PRESENTATIONS

Matulich, Scott C., Joshua A. Greenberg and Ron C. Mittlehammer. "The Prominence of Japan in the Alaska King Crab Fishery." Chap. 13 in *In Understanding the Multifaceted Japanese Market*. Ed. D. O'Rourke, Hayworth Press Inc., 1991.

- Workman, William G., Wayne C. Thomas and Joshua A. Greenberg.
"Economics of Reindeer Rangeland." *Agroborealis*, 23(1), January 1991.
- Greenberg, Joshua A. "An Econometric Analysis of the Alaska King Crab Industry: A Bioeconomic Perspective." Ph.D. Dissertation. Washington State University, December 1990.
- Matulich, Scott C., Joshua A. Greenberg and Ron C. Mittlehammer. "A Model of Exvessel Price Determination in the Bristol Bay King Crab Fishery." Ag. Econ. Ser. 90-2.1, Department of Agricultural Economics, Wash. State U., Pullman, December 1990.
- Matulich, Scott C., Ron C. Mittlehammer and Joshua A. Greenberg.
"Predicting Japanese Wholesale Price and Demand for Alaska King Crab." Ag. Econ. Ser. 90-2.1, Department of Agricultural Economics, Wash. State U., Pullman, December 1990.
- Joshua A. Greenberg. "Bioeconomic Modelling--Application to the Alaskan King Crab Fishery." Seminar Presented at the Alaska Department of Fish and Game, Juneau, June 1991
- Joshua A. Greenberg. "The Internationalization of Alaska Natural Resources: An Essential Perspective." Seminar Presented at the University of Alaska Fairbanks, School of Land and Resource Management, Fairbanks, Sept. 1990.
- Greenberg, Joshua A. and Scott C. Matulich. "The Role of Japan in King Crab Price Determination." *Proceedings of the International Symposium on King and Tanner Crabs*, Anchorage, Nov. 1989.
- Matulich, Scott C. and Joshua A. Greenberg. "Alternative Spawner-recruit Specifications for Alaska Red King Crab." *Proceedings of the International Symposium on King and Tanner Crabs*, Anchorage, Nov. 1989.",
- Greenberg, Joshua A. "Development of Agricultural Cooperatives with an Application to the Alaska Reindeer Industry." Paper presented at the Alaska Agricultural Conference, Fairbanks, April 1985.
- Greenberg, Joshua A. "Designing a Grading System for Alaska Reindeer Antler." Paper presented at the Annual Meeting of the Alaska Reindeer Herders Association, Nome, March 1985.

Greenberg, Joshua A. "Optimal Reindeer Herd Management Plans." Paper presented at the Annual Meeting of the Alaska Reindeer Herders Association, Nome, March 1985.

Greenberg, Joshua A. "An Alternative Marketing Plan for Alaska Reindeer Antler." Paper presented at the Annual Meeting of the Alaska Development Council, Juneau February 1985.

GRANTS and CONTRACTS

Greenberg, Joshua A., and Mark L. Herrmann. "Economic Impacts of Alternative Potlimits in the Bering Sea and Aleutian Islands King and Tanner Crab Fisheries." ADF&G, 1991 (\$25.0K)

Herrmann, Mark L., and Joshua A. Greenberg. "An Economic Analysis of World Markets for Wild and Farmed Salmon." AK. Sea Grant, Pending (\$77.756K)

PAPERS IN PREPARATION

Greenberg, Joshua A., Scott C. Matulich and Ron C. Mittlehammer. "Exvessel Price Formation Within a Bilateral Monopoly Framework."

Greenberg, Joshua A., Scott C. Matulich and Ron C. Mittlehammer. "The Influence of the Japanese-U.S. Exchange Rate on Price and Allocation of Alaska King Crab."

Matulich, Scott C., and Joshua A. Greenberg. "Bioeconomic Modelling of the Alaska King Crab Fishery."

Proposed RSA for Evaluation of Predictive Power of Salmon Demand Models

Discussion Draft

Project Leader:
Jeff Hartman, Economist
FRED Division

Background:

A large salmon enhancement program has developed in Alaska. It is composed of state owned and operated hatcheries, and hatcheries operated under the Private Non-Profit tax status. The harvests from this program now range from 15 to 23 million fish annually. Even within existing capital resources generated from the projects, the catch is expected to grow to approximately 30 million fish by 1995. The enhancement program could soon account for 20% to 35% of the statewide salmon harvest. Many of the technological constraints to expanding the program have been overcome in the last decade (although some fleet management constraints exist).

A number of policy questions have arisen as a result of the success of the program that require economic reasoning and modeling to answer. Specific segments of the following questions will be addressed in this RSA.

1. If planned releases continue to produce increases in the statewide salmon harvest, at what level of production would capture fisheries no longer realize positive changes in total revenue from increased output? What is the optimal (not considering production costs) distribution of species from enhancement in the near term and as the total revenue begins to level off?
2. What is the best approach for producing pre-season (1990) estimates of average annual price for each species of salmon aggregated statewide and a regional in-season price for Prince William Sound? Note; that the later question on regional in-season prices will not be addressed in this RSA.

The Prince William Sound Aquaculture Association has expressed interest in trying to develop a more formal approach to budgeting, and also to addressing broader questions on the economic consequences of fishery enhancement in Alaska. The budgeting issues revolve around making an accurate forecast of the revenues available from cost recovery capture of salmon and from the enhancement tax revenues. Both of these issues depend on a precise pre-season estimate of prices to fishers, and the cost recovery harvest in Prince William Sound. Currently, at the request of the Prince William Sound Aquaculture Association (PWSAC) fish processors will begin to make some informal predictions about in-season price as

early as late January (Susumoto, pers comm 1990). Updates of these price estimates will be solicited by PWSAC as the season approaches. PWSAC, however, must present their annual management plan to Government and other organizations in December. This document requires a detailed plan for hatchery operations that is strictly dependent on Regional Association earnings (and in-season prices).

Additionally, PWSAC will solicit pre-season bids for salmon from processors. This interaction would be enhanced by a more formal approach to estimating in-season prices.

3. Costs imposed on other regions.

The size of the capture fishery harvest (including the increment from enhancement) has been found to be an important variable in the determination of annual salmon prices in Alaska. Analysts and policy makers are interested in how the costs in terms of decreased total revenue, are distributed between different fishing regions within the state. Regionalized demand and supply models would be helpful for this exercise, but this task will not be the focus of this immediate RSA.

4. General equilibrium areas of producer and consumer surplus.

Private industry may not typically be as concerned with the statewide effects of regulations and broader Government policies on enhancement as the State of Alaska. Regional fishing groups are usually charged with improving the welfare of the individual fishermen in that region. Welfare changes can be predicted with demand models, and cost functions, so that ADF&G can evaluate the efficiency of proposed regulatory policies from a statewide perspective. Models that capture rents at an intermediate market level may not be as well suited to identifying total change in producer and consumer surplus from an general equilibrium perspective. For example, if processors capture rents not reflected in market prices (input markets are not perfectly elastic, or processors have monopoly power), or if non-price payments to fishermen become significant, they may understate net welfare effects. Note: this RSA will not fully address vertical (markets between producer and consumer) and horizontal (markets involving substitutes) markets that might be investigated to address a general equilibrium surplus measurement questions.

Economists have had considerable success in the last two decades in developing demand models for predicting food commodity prices. It is believed that new work in the area of salmon demand models have presented better tools for addressing the above questions.

Objective:

To establish which of the existing demand models has the best predictive abilities three ex-vessel demand models created for pink, chum, and sockeye salmon by CFEC, ADF&G, and ISER will be compared with the salmon derived demand models created by UAF. Also

the Principal Investigator (UAF) will make estimates of ex-vessel prices for the 1990 fishing season for all 5 species. The Principal Investigator will also recommend a set of 5 models (one for each species) that would have the best performance for predicting consumer and producer surplus for variations in enhancement output.

Description of Parties involved:

This RSA predominantly describes a contractual agreement (through a Reimbursable Services Agreement) between ADF&G, FRED Division and the University of Alaska-Fairbanks. Jeff Hartman of ADF&G, FRED Division will be referred to as the Contractor, while John Boyce Professor at University of Alaska-Fairbanks will be referred to as the Principal Investigator. Prince William Sound Aquaculture Association is the funding agency.

Deliverables and Instructions:

1. The models will forecast ex-vessel prices for all five species of Pacific salmon, and will be judged on:

- conformance to economic theory.
- econometric statistics generated in the estimation.
- analysis of prediction errors (see appendix 1).

The performance of candidate demand models for sockeye, chum, pink, coho, and chinook salmon will be judged by their ability to estimate annual CFEC ex-vessel prices. Note: the Contractor (FRED Division) will supply the time series of ex-vessel and wholesale prices to the Principal Investigator. Specific econometric tests for the estimation of errors are defined in Appendix 1, but ability to maximize R^2 values (as well as the sign and significance of the coefficients on the independent variables) will be highly weighted in judging model performance. The Principal investigator will also ~~make~~ choose an interval of the time series for an out-of-sample test and compare the above tests between predicted and observed dependent variables.

The econometric models will also be compared with a naive predictor (such as average historical prices or a trend analysis) that will simulate how in-season and annual prices are forecasted in the absence of econometric models.

3. After model performance has been established, the Principal Investigator (UAF) will run model simulations aimed at predicting annual CFEC prices for all 5 species of salmon, statewide. An additional price forecast will be made for Pink salmon that are harvested in Prince William Sound region (to be based on annual CFEC ex-vessel prices. The price estimate is to be made before the 1990 pink season in PWS starts approximately July 1. A second estimate will be made for the 1991 pink harvest season in December of 1990. The forecast date is to cover harvests of pink salmon in Prince William Sound from July 1 to September 7, 1991. This estimate is also to conform to annual CFEC prices (not in season prices). Appropriate sensitivity testing will be applied to test how variability in the input variables will affect the variability in the dependent variable of ex-vessel price. See Lin and

Hermann (1988) An econometric Analysis of Atlantic Salmon Markets in the United States and Japan for an example of how the sensitivity analysis could be carried out.

4. The Principal Investigator will also apply the 5 best annual price forecasting models (one for each species) to compute the level of output that conforms to unit elasticity of 1. This would be where the instantaneous rate of change in Total Revenue is equal to 0.
5. The Principal Investigator will be required supply a description of how the models and how the estimation procedure works. The Principal investigator will supply working files of the models with the best predictive power and all tests made (but not program files) to the Project Leader (Jeff Hartman). The dependent variables in the models will be ex-vessel price and wholesale price. A set of basic instructions will be provided for using the 5 models. A brief discussion of potential errors and biases in the data and results for above exercises will be included. A discussion of how the models should be used for estimating producer and consumer surpluses should be included. An example of a documentation that is sufficient in detail to serve as an example of what would be expected is attached (Ronan 1989).
6. All pertinent data, electronic files, and model equations for reconstructing demand models and statistical tests will be made available to the contractor (FRED Division) by the completion date of the project.

Materials to be supplied by the contractor (FRED Division) to Principal Investigator:

- All CFEC aggregated gross earnings series, and harvest series, for coho, chinook, sockeye, chum, and pink salmon by region, for the seine, gill net, and troll fishery from 1974 to 1989.
- A CFEC aggregation of gross earnings of processors by salmon species (and for eggs) from 1984 to 1989.
- A Demand Model for Sockeye salmon created for FRED Division under a 1989 contract.
Ronan, N. 1989 Simple Demand Models For Alaska Sockeye Salmon Prices.
Institute of Social and Economic Research. University of Alaska, Anchorage. 29pp
- A 1985 paper written by Ben Muse on a Bristol Bay sockeye salmon price forecasting model.
- SAS equations for semi-log models for pink, chum, and sockeye, made by Ben Muse in 1984.
- A 1990 CFEC paper by Ben Muse on testing of ex-vessel demand models, comparing predictive power with naive statistical predictors.

-Cost of RSA:

\$2,500 - \$3,500

Project Calendar:

- Letter of agreement between FRED Division and PWSAC completed. 5-4-90
- Comment, correction and Approval of the Letter of Agreement by PWSAC. 5-11-90.
- RSA between FRED and UAF completed. 5-7-90.
- Negotiation of RSA with UAF (Department of Economics). 5-11-90.
- Approval of RSA by UAF and ADF&G Division of Administration 5-18-90.
- Providing all historical fishery, price and harvest information, and documentation of comparative price forecasting models required by Princ. Investigator (UAF). 5-18-90.
- Providing of preliminary deliverables by UAF, including proposed price forecasting models for average annual forecast, point price estimates, statistical test results for comparing ex-vessel models with derived demand models. 6-30-90.
- Review of preliminary deliverables such as proposed models, data compatibility problems, statistical test results. 7-15-90.
- Completion of Final Report. 8-6-90.
- Review and approval of final RSA products and deliverables, final models, statistical software provided by the Principal Investigator, annual price forecasts for each species, total revenue maximizing output, documentation for models, other supporting data provided by UAF. 8-15-90.

Approach for Administering the RSA:

Letter of Agreement (LOA) from PWSAC to ADF&G and RSA from ADF&G to UAF.

An economist needs to be the contracting officer in this project. Additionally ADF&G owns and operates some of the demand models that would be used to compare against the UAF derived demand models. A small PSA agreement between PWSAC and ADF&G would allow for the transfer of the full \$2,500 to \$3,500 in funds to ADF&G. ADF&G would then RSA funds to UAF according to the RSA completion schedule. The professional services agreement would itemize the products that would be provided to PWSAC by FRED Division.

Products to be provided by FRED Division Economist:

- Draft LOA between FRED Division and PWSAC.
- Solicit comment, correction and Approval of the LOA by PWSAC.
- Draft of the RSA.
- Negotiation of RSA with UAF (Department of Economics).
- Coordinate review and approval process for RSA by UAF and Division of Administration.
- Providing all historical fishery, price and harvest information, and documentation of comparative price forecasting models required by the Principal Investigator.
- Review of preliminary deliverables such as proposed models, data compatibility problems, statistical test results. Date: July 15, 1990.
- Review and approval of final RSA products and deliverables, final models, working electronic files provided by the Principal Investigator, annual price forecasts for each species, and total revenue maximizing output. Date: October 15, 1990.

Appendix 1. Statistical Tests for analyzing prediction errors.

For each of the specified price models, the Principal Investigator will compare model price forecasts with actual prices, and calculate and graph the prediction errors, and calculate the following statistics:

- mean percent error
- mean absolute error
- mean squared percent error
- Theil's bias, variance, and covariance and Theil's bias, squared percent error (as described in Maddala, pages 344 and 345),
- Theil's U1 statistic, as described in Maddala, pages 346 and 347,
- root mean squared error

Where appropriate, the Principal Investigator will compare the errors produced by the different models and will test to see if there are statistically significant differences between the mean absolute percent errors and the mean squared percent errors produced by those models. Parametric and non parametric tests will be used to evaluate statistical significance.

The Principal Investigator (UAF) will summarize these statistics in a convenient form. This form should permit easy comparisons of the statistics for comparable models. The Principal Investigator will provide a description of the error statistics that will be useful to persons unfamiliar with them, and will discuss the implications of the errors for the use of the models, and for future research directions. Among other research possibilities, the Principal Investigator will evaluate the potential of combining the structural models evaluated in this RSA with time series models of their error terms.

SALMON FORECAST

I have been looking for the rest of this article for months!

European surplus dwindles while North American supplies continue to rise

by Sinbad

Last year about a third of all salmon harvested in the world was farmed. Anybody ordering fresh salmon in a North American or European restaurant would find he or she was most likely eating a farmed fish. Salmon consumption worldwide has increased at a time when many staple marine fish species are in decline.

Surprisingly, farmed salmon out-

Supplies of fresh farmed salmon are likely to dip further this year following sharp cut-backs in Norway. The full effects of the failure of the Norwegians to safeguard markets for their product in both the United States and Europe will not be felt until 1993 when output is expected to drop to about 100,000 tonnes. This is a devastating collapse from their peak year in 1990 when official production was

an instant 10-15% price hike. Many growers took advantage of this and harvested higher than usual numbers before Christmas. As for the Norwegians, it is not surprising that their prime minister, Gro Harlem Brundtland, announced in April that she would seek E.E.C. membership for her country. As this cannot happen before 1996 the Irish and Scots will be operating in a protected European market for the next three years.

Salmon prices to the fish farmer have halved in real terms since 1989. The industry in Europe has reacted by cutting back production. In Scotland the number of smolts put to sea has dropped from 24 million in 1989 to 20 million in 1991. The Norwegians claim an even bigger drop - from 80 million in 1989 to 50 million in 1991.

Already prices are firming in Europe, and should improve further as European farmed salmon output drops a further 15% from 1992 to 1993. One of the main Scottish banks serving the salmon farming industry, the Trustees Savings Bank, claims that there could be a shortfall of some 40,000 tonnes of farmed salmon in Europe by next year.

Changes in B.C.

In North and South America the outlook is quite different. Output of farmed salmon continues to surge ahead (Table 2). This is particularly so in Chile and British Columbia as the emphasis changes to Atlantic salmon. Chinook salmon have proved to be a disappointment in British Columbia, though an inter-firm comparison study recently completed by David Egan of Vancouver's A.R.A. Consulting group shows that even

World Farmed Salmon Production

	1990	1991	1992 (projected)	1993 (projected)
Norway	158,000	155,000	125,000	105,000
Scotland	33,000	40,600	35,000	30,000
Chile	19,400	26,600	33,500	35,000
Japan	25,900	27,000	27,000	27,000
Canada*	20,750	27,500	28,700	31,000
Faroese	12,000	15,800	15,000	12,000
Ireland	7,500	8,300	9,000	8,000
U.S.*	3,900	6,200	10,500	12,000
Rest	6,100	7,500	5,500	6,000
	286,550	314,300	289,200	266,000

* Both coasts

put only increased by about 10% in 1991 to 314,300 tonnes (Table 1 above). Prices remained soft because of a combination of factors. The recession and the Gulf War disrupted travel and caused people to cut back on eating out. All this coincided with a bonanza year for wild salmon, particularly in Alaska. It is not widely appreciated that a major reason for the abysmal salmon prices in 1991 was the huge catch of Alaskan pinks. The 45,000 tonnes of farmed Atlantics in Norwegian freezers didn't help matters either.

158,000 tonnes but actual tonnage was probably closer to 175,000.

Scotland & Ireland

The amount of farmed salmon is also decreasing in Scotland and Ireland. Most of the larger companies are cutting back as they attempt to find a way of making money. Only those in favored locations like the Shetland Isles of Scotland are still expanding. Output from Scotland was artificially high last year. When tariffs were imposed on Norwegian farmed salmon by the European Commission in November there was